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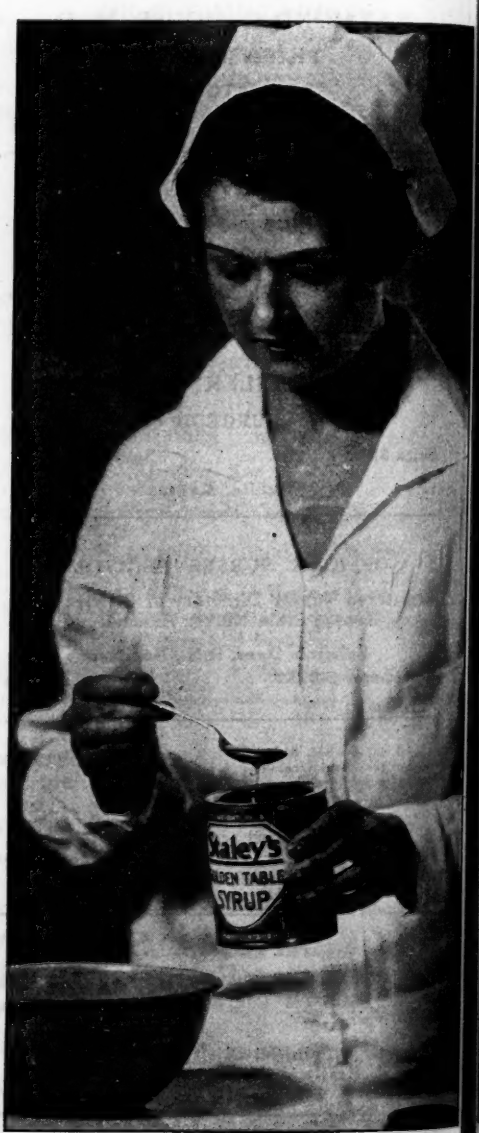

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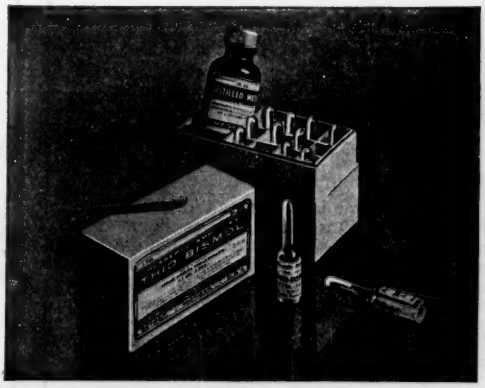


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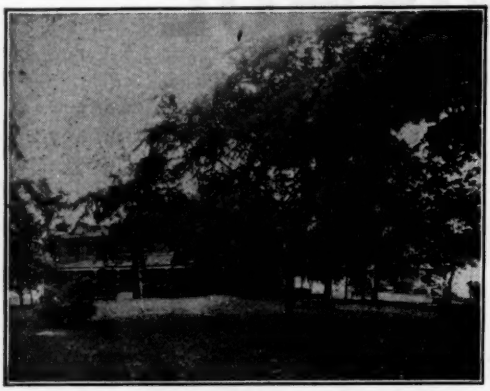

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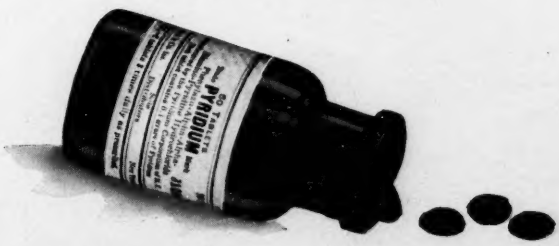


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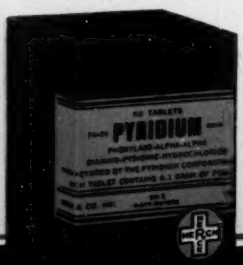

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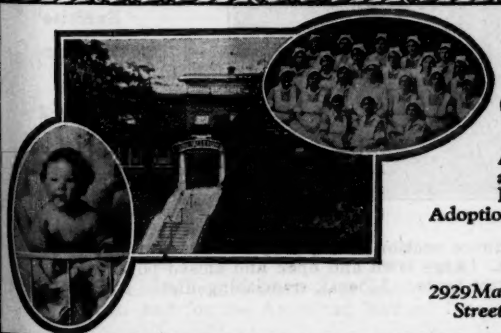

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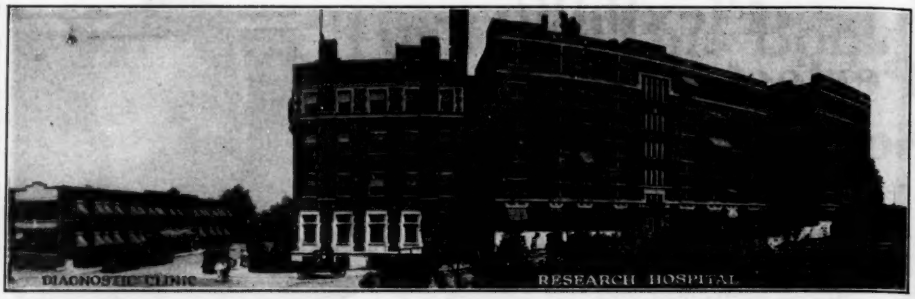


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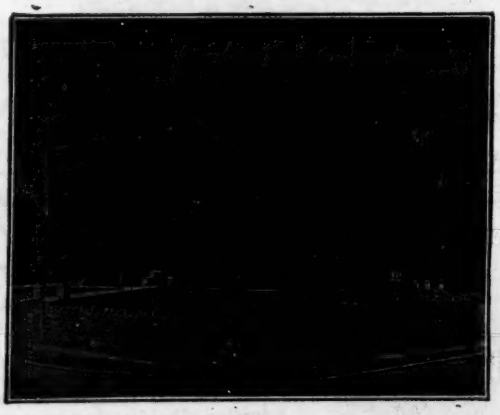

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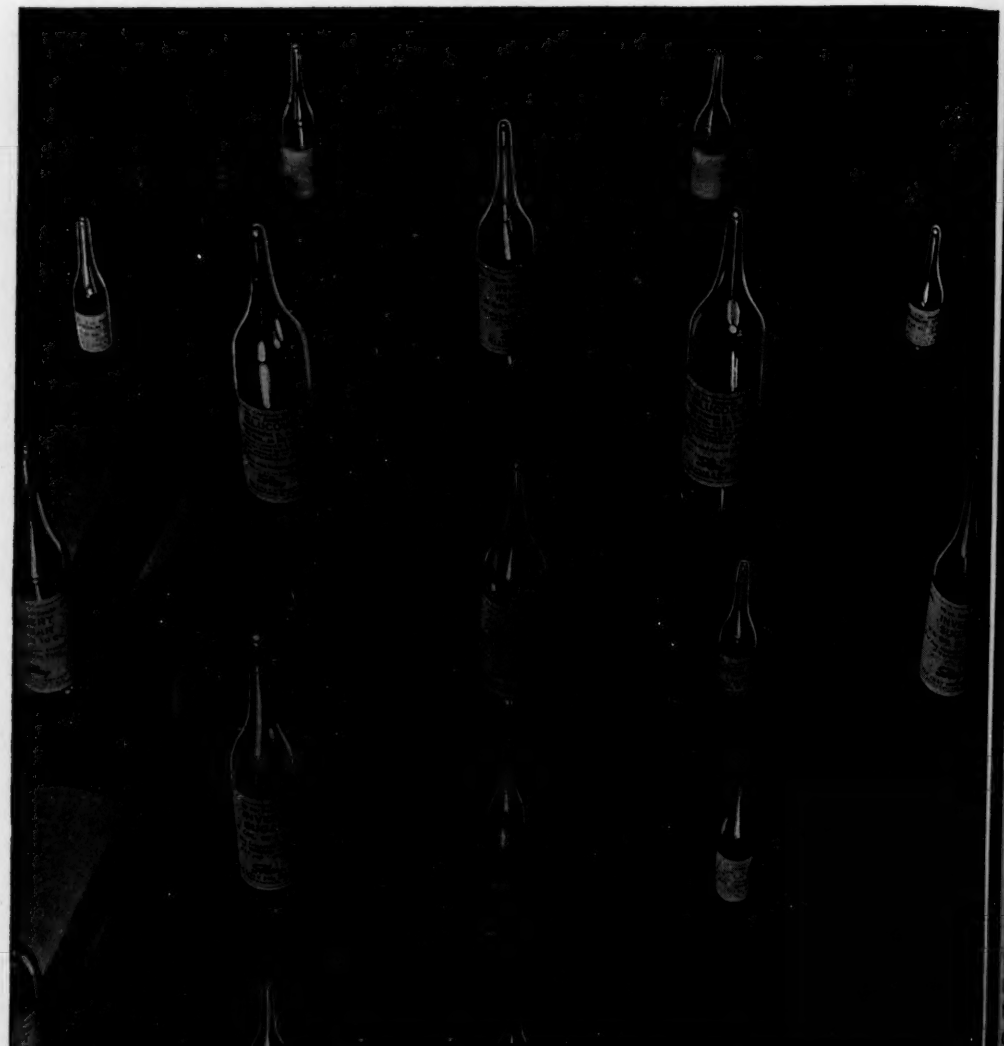

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## Acute Intestinal Obstruction

R. D. RUSSELL, M.D., Dodge City

Read before the annual meeting of the Kansas Medical Society, at Topeka, Kan., May 7, 8 and 9, 1930.

Acute intestinal obstruction is a symptom complex consisting of pain, vomiting, blocked bowel, visible peristalsis, and no fever. One, or even two, of these cardinal symptoms may sometimes be lacking but a combination of the five are the symptoms and signs upon which a diagnosis of ileus is usually made.

The *pain* is abdominal in type, sudden severe cramp-like, and colicky. Sleep is disturbed or impossible. The patient knows the very hour when his attack began. The pain is not referred to the bladder or under the right scapula. It is always present. Morphine obscures this symptom.

*Vomiting* is usually present, at first it is reflex, later it is constant from overflow of the stomach. It increases in frequency as time goes on and consists first of stomach contents, then the bile stained contents of the duodenum. Still later the vomitus is of brown fecal material, but the condition should have been recognized and relieved long before the appearance of fecal vomiting. Obviously the higher the obstruction, the earlier constant vomiting will appear. In low obstruction of the large bowel vomiting may not be present. Morphine destroys the significance of this symptom.

*Blocked Bowel* is frequently overlooked because the bowel may move once or twice after the obstruction has occurred. The bowel empties below the obstruction. But after this there is absolute constipation, neither gas or fecal contents are passed. Repeated enemas should be given. Cathartics must never be administered, they do no good but only harm. Occasionally we see patients who believe they have bowel obstruction because the bowels do not move and enemas are unproductive. This is not a mechanical block, for they have no pain or vomiting.

*Visible peristalsis* is frequently though not always seen. It is very important. Associated with the four other cardinal symptoms it makes the diagnosis certain. Peristalsis can not be seen if the patient has had morphine. A fat abdominal wall obscures this sign, visible peristalsis is usually an early sign. It is very valuable in drainage appendix cases which develop ileus while still in the hospital and it is often the determining factor in deciding the diagnosis. Even in the presence of a drainage wound this sign promotes absolute confidence in the necessity of reopening the abdomen. In looking for visible peristalsis the entire abdomen should be exposed. The patient must be in a good light, and it is necessary to spend sometimes an hour or more inspecting the abdomen from above, lengthwise and crosswise. A careful inspection of the abdomen may result in the saving of the patient's life. A hasty glance at the abdomen is insufficient. Visible peristalsis does not always indicate obstruction for in cachectic individuals normal peristaltic waves may be seen. Babies may show this sign from a number of conditions. Visible peristalsis is pathognomonic of mechanical obstruction only when accompanied by the other cardinal symptoms.

Early uncomplicated obstruction usually has no *fever*. Fever is almost never present in uncomplicated cases.

The following may be regarded as occasional or minor signs:

Relaxed abdominal wall, tumor, bloody mucus from anus, distended abdomen, leucocytosis, and shock. Relaxed abdominal muscles are very often seen. The muscles are flaccid. Placing the hand on the abdomen gives one the sensation of palpating a rubber water bag filled with water and no air. This flaccid condition of the abdominal muscles makes possible

the phenomenon of visible peristalsis. If there is a considerable mass of strangulated bowel the abdomen will be rigid. In intussusception and cancer a tumor may be felt. Bloody mucus from the bowel is present in intussusception and at times in cancer.

Most textbooks stress distention of the abdomen. Marked distention, however, is a late sign except in low obstruction, and we should not wait for it. Early the abdomen will be neither scaphoid or distended to any degree. We must make our diagnosis before distention occurs.

The leukcocyte count is not important. It will vary from low to high. It is of little value in making a diagnosis. In ileus there is apt to be an early primary shock but this soon passes away.

Because of the frequency of obstruction due to strangulation of a hernia both inguinal rings and both femoral rings should be carefully palpated in all cases in which intestinal obstruction is suspected. These examinations are frequently neglected.

A classification of intestinal obstruction is important. The following working classification may be used:

(1) *Dynamic Ileus* is that type in which the musculature of the intestine is contracted. This occurs in lead poisoning, certain cheese poisoning and in some diseases of the central nervous system, such as tabes dorsalis. (2) *Adynamic ileus,* in which the musculature of the bowel wall is paralyzed, as in peritonitis, torsion of the pedicle of ovarian cysts and fibroids, epididymitis, gall-stone and renal colic and reflexly with pneumonia and pleurisy. In this type of ileus the distention may be so symmetrical that no intestinal patterns are seen. (3) *Mechanical Ileus,* in which there is a definite mechanical obstruction to the lumen of the bowel, such as occurs in carcinoma, and in ileus due to bands of adhesions. (4) *Strangulation Ileus,* in which the vessels are involved as in embolism and thrombosis. The vessels may be secondarily involved, and mechanical ileus may become a strangulation ileus. In different types of paralytic ileus the vessels may also be primarily and secondarily affected.

Acute intestinal obstruction is usually caused by the following conditions: Strangulated hernia, adhesions following previous abdominal operations, adhesions after pelvic cellulitis, intussusception in infants and children, and malignancy of the large intestine. Intussusception in adults, volvulus, herniation of the intestine through the foramen of Winslow, and obstruction due to developmental anomalies are rare conditions.

The prompt diagnosis of this condition and the early resort to surgical relief of these cases is essential to their recovery. Without surgery all cases of complete, acute intestinal obstruction would die. There is no field in abdominal surgery that challenges our attention more than this.

Ileus is a surgical condition in which the mortality remains high. It has remained stationary or has been but slightly reduced in recent years. Improvements in asepsis and better clinical studies have apparently not reduced the mortality to any great degree.

The incidence of intestinal obstruction is increasing. Hundreds of thousands of laparotomies are being done every year. Each is potentially a case for ileus, and slightly less than half of the cases that develop it have had previous abdominal operations.

The responsibility of late operations is occasionally on the patient, rarely on the surgeon, but generally on the physician first called. In but few cases does the patient seek medical aid late. The sudden, severe pain urges the patient to send at once for a physician. The sufferer seems intuitively to realize that relief can not be expected from spinal manipulations or even radio consultation.

Much of the experimental work undertaken to determine the toxicity of the contents of an obstructed loop has been contradictory, and there is no unanimity of opinion among investigators as to whether a specific toxin is formed in the obstructed loop and as to the factors which influence the absorption of such a toxin, if present.

If the contents of the obstructed loop are toxic, and most of those studying the problem clinically and experimentally be-

lieve that they are, it is of prime importance to determine the factors concerned in the rate of absorption and how such absorption may be delayed or prevented.

Even if there is a mass of conflicting evidence, it seems safe to conclude that the contents of the bowel above the obstruction are toxic. The nature of the toxin is not known and the toxicity varies considerably. It is important to differentiate between mechanical and strangulation type, for in the latter we are dealing with substances encountered in moist gangrene associated with the toxemia of infection and tissue necrosis in addition to the obstruction. Toxicity is reduced by washing out the contents. The toxicity of the contents is increased when infected, as is indicated by one of Murphy and Brook's experiments in which the toxicity was increased when a streptococcic infection occurred in the closed loop. Animals with a closed loop may live a long while. They live longest when the closed loop is low down. If the bacterial content plays an important factor in the symptoms, low obstruction should have more marked and rapidly developing symptoms than high obstruction, because of the greater bacterial content of the lower bowel. The reverse of this, however, is true.

A study of the blood in obstruction reveals a leukopenia, slightly increased fibrin content, high nonprotein nitrogen, due almost entirely to an increase in the amount of urea, low chloride content and a high carbon dioxide combining power. In the scanty urine there is a trace of albumen, the nonprotein nitrogen excretion is increased, there is a low chloride excretion and traces of phenol and indican. Haden and Orr believe that the decrease in chlorides is due to fixation in the tissues of the chlorineion with the specific toxin absorbed from the bowel. In support of this theory they have reported experiments in which dogs with high obstruction have been kept alive from twenty to thirty days by giving normal salt by hypodermoclysis. The fall, however, in blood chlorides is not always present in fatal cases of obstruction, and the fall is usually proportional to the amount of chlorides lost in the vomitus or in the fluid which has accumulated in the bowel. Substitutes for salt are apparently ineffective in combatting this condition, and while life may be prolonged by salt solution, the animal eventually dies. The cause of death cannot be directly ascribed to one factor.

Dehydration has frequently been suggested as an important factor in death from obstruction. Draper, however, pointed out some years ago that the degree of dehydration observed in dogs with obstruction is no greater than that observed when dogs are fasting and still the clinical pictures are entirely different.

An analysis of the voluminous studies which have been made upon ileus is somewhat confusing because of the contradictory statements made by different investigators when engaged upon the study of the same phases of the problem. It may seem rather commonplace to state that successful treatment of ileus depends upon an early diagnosis. Until an early diagnosis is made the mortality will not be reduced. In order to make a diagnosis one must visualize what may occur in the abdomen, and this emphasizes the need of a definition and classification of ileus. One should know the age incidence of the different lesions, which may lead to interference with the lumen or peristalsis of the intestine.

In mechanical obstruction, providing strangulation has not occurred, a catheter should be inserted into the bowel above the point of obstruction after the obstruction has been removed. This helps prevent absorption of the toxic material from the obstruction loop. If, however, the case is so advanced that there is no peristalsis above the point of obstruction, naturally not much can be expected from the enterostomy.

In obstruction of the large bowel, frequently due to constricting carcinomas of the rectosigmoid junction or the sigmoid a colostomy may be performed. The possibility of perforation of the cecum in these cases should always be kept in mind. The insertion of a catheter into the cecum in these cases is frequently a

valuable procedure, for it relieves gas tension and guards against the development of distention ulcers.

In any case in which a resection is indicated, the proximal loop should be kept under control. It should be fixed in the abdominal wall so that it may be opened when indications for such a procedure arise. Control of the proximal loop is not infrequently vital in these cases.

In paralytic ileus due to peritonitis or other causes, the original lesion must receive appropriate treatment. In these cases an enterostomy is a valuable procedure. The enterostomy is preferably made in the jejunum. What the results will be is usually determined early, for if the paralysis is so far advanced that there is no peristalsis to force out the contents of the loop, the ileus will proceed to a fatal termination. The stomach may have to be washed out repeatedly in order to avoid dilatation and the accumulation of the material of the distended loops which pass back into it. Hypertonic salt solution, as advocated by Haden and Orr and others, is of value and should be employed, both as a preoperative measure to reduce the operative risk, and also post-operatively.

The tragedy of ileus is due to late diagnosis. We can not save by surgery or other therapeutic measures those in the terminal stages of ileus. Intestinal obstruction should be recognized in its early stages when the obstruction, mechanical or paralytic, can be treated by appropriate surgical procedure. We can not expect to reduce the mortality in these cases until they are recognized and operated upon early. This is an ancient statement, but one that may be repeated with profit, and to our advantage, and that of the patient even at the present time.

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## The Diagnosis of Acute Osteomyelitis

E. E. Morrison, M.D., Great Bend

Read before the annual meeting of the Kansas Medical Society, at Topeka, Kan., May 7, 8 and 9, 1930.

Acute osteomyelitis is not of frequent occurrence. At the Toronto Children's Hospital with a capacity of 262 beds, 207 cases were treated in 12 years. Platt reports that in England and Wales in the year 1926, there were 417 deaths from acute osteomyelitis and 2,710 deaths from acute appendicitis. The mortality of acute osteomyelitis has been estimated to be from four to six times as great as that of acute appendicitis. Congdon estimates that in his section of the country, perforations of gasric and duodenal ulcers occur more frequently than acute osteomyelitis, and that the general practitioner sees but one case of that disease in seven years. The infrequency of the disease causes it to receive little study by the men who first see it.

The early diagnosis of acute appendicitis is of little importance as compared with the much greater importance of the early diagnosis of acute osteomyelitis. The attack of acute appendicitis may subside; a localized peritonitis with pus formation may result; or there may be a gangrenous appendix with perforation. In any event, a late operation may result in complete recovery. The attack of acute osteomyelitis, if neglected, has a far greater possibility of death and the most favorable result of a late operation will be a deformed and crippled limb.

DIAGNOSIS

In establishing the diagnosis of acute osteomyelitis there are anatomical, physiological, pathological and clinical factors which must receive consideration.

*Age*—Acute osteomyelitis is a disease of childhood. It rarely occurs after the age of fifteen. Most cases occur between the ages of two and ten. Cases are seldom found after the epiphysis becomes united in bony union with the shaft.

*Sex*—Boys are affected about twice as often as girls. Their exposure to weather conditions, to injuries, and to infections is greater than that of girls.

*Location of Infection*—The localized infection usually occurs in the end of a long bone. The location in order of fre-

quency is as follows: The upper end of the tibia; the lower end of the femur; the lower end of the tibia and fibula; and the upper end of the humerus. Other locations are infrequent. Occasionally the infection occurs in a flat bone as the ilium or scapula. In about seventy-five per cent of all cases but one bone is involved. Two bones may be involved at the onset. A second bone occasionally is involved some length of time after the involvement of the first.

ETIOLOGY

*Trauma*—As a rule there is a history of an injury at the site of the localized infection. The injury may have been a bruise or a strain. There may have been a partial epiphyseal separation.

*Malnutrition*—Any debilitating disease as diabetes, nephritis or tuberculosis is a predisposing factor. The poorly fed and undernourished have the same predisposition. Keen says that a prolonged stay in the swimming pool predisposes to an attack. If this be true, the child who is taken out in cold weather with bare legs is subjected to the same risk

*Focal Point*—Nearly always there will be found an infected skin lesion—a furuncle, an infected finger or toe, more rarely an infected umbilicus. In a small percentage of cases there will be found an infection of the mouth, throat, nose, or of the accessory sinuses.

*Pathology*—The infective agent is carried by the blood stream to the cancellous structure at the end of a long bone. The arrangement of the blood vessels in the cancellous portion of the bone is an admirable one for the arrest of blood-borne infection. The vessels are large, tortuous and contained within unyielding walls. The cancellous tissue is covered by a thin layer of compact bone traversed by many Haversian canals, and blood bearing interstices. The epiphyseal union is dense and prevents extension of the infection directly into the joint.

As the infected area spreads it spreads in the direction of least resistance, through the Haversian canals and through the blood bearing spaces of the interstices to the under surface of the periosteum, the infection then spreads very rapidly stripping the periosteum from the surface of the bone. Necrosis of the bone follows and rapidly progresses. The periosteum has a firm and dense attachment at the epiphyseal line. This attachment keeps the infection out of the joint for a long time.

Recent and more careful studies at autopsy and recent careful animal experimentation have demonstrated to the satisfaction of those doing this work, that the early and the principal extension of infection is not into the medulla. Infection of the medulla occurs in the chronic stage of the disease.

Starr reports that in the clinic of the Hospital for Sick Children at Toronto, observations extending over a period of twelve years, showed the staphylococcus to be the infective agent in 71 per cent of the cases, and the streptococcus in 13 per cent. In a small percentage of cases a few other germs and combinations of germs were found to be the causative factor.

CLINICAL COURSE

The onset of acute osteomyelitis is sudden and severe. The outstanding and principal feature is terrific pain. It is increased by heat because the rigid cavities of the infected area are already tightly filled with the products of inflammation and heat brings more blood and increases the tension. Many years ago Nicholas Senn taught that before swelling or redness appears pressure with the finger tip over the metaphysis will locate a small point of pronounced tenderness over the infected area beneath the cortex. For several days, even after the infection has broken through the cortex and the limb is greatly swelled, the joint may be moved and manipulated freely without pain. Several days after the onset a serous fluid may collect in the joint. Its nature may be determined by aspiration.

The temperature, which may be preceded by a chill, rises to 103 or 104 degrees. There is a toxemia which is often pronounced and sometimes merges into coma. The pulse rises to 120 or 130 per minute. The white cell count is high, ranging from 20,000 to 30,000.

As acute osteomyelitis is a blood-borne infection, blood cultures will reveal the

infective agent in the early stage of the disease. Should the bacteriemia persist, the outlook is grave.

When the infection passes through the cortex to the under surface of the periosteum, it progresses rapidly, stripping that membrane from the bone. Necrosis of the bone rapidly follows. However, when the infection has broken through the cortex and involved the periosteum, the disease has passed from the acute into the chronic stage.

*Roentgen-Ray Findings*—In acute osteomyelitis the *x*-ray film is negative and valueless. Many cases have been improperly treated because the *x*-ray revealed nothing. When bone changes can be demonstrated by the *x*-ray, the case is no longer acute. It has become chronic and irreparable damage has been done.

SUMMARY

The early diagnosis of acute osteomyelitis depends upon a good working knowledge of the various factors of which the disease is made up. Briefly stated they are as follows:

1. Age.
2. Sex.
3. Location of infection.
4. Trauma.
5. Malnutrition and exposure.
6. A focal point.
7. The pathology of the disease.
8. The clinical course.

Acute osteomyelitis in the early stage is usually treated as rheumatism; sometimes as infectious arthritis. The infection is near the joint but not in it. This may easily be demonstrated by manipulation of joint.

In the case of acute osteomyelitis that is promptly recognized and promptly treated there will be no involucrum; there will be no sequestrum; there will be no question as to time or method of operation; there will not be a deformed and crippled child.

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## A Clinic—"Jake" Paralysis

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and
J. P. KASTER, M.D.
Chief Surgeon A. T. & S. F. R. R.

Read before the annual meeting of the Kansas Medical Society, at Topeka, Kan., May 7, 8 and 9, 1930.

[By special request these two cases of so-called "Jake" Paralysis then under treatment at the Santa Fe Hospital were presented before the Society.]

J.D.T., car oiler, white male, age 42, married twenty-five years, was admitted April 12, 1930.

His chief complaint was pain, aching and cramping in the abdomen, diarrhea, weakness, pains in the back.

His present illness started April 8, 1930, with a severe pain in the upper part of the abdomen, with a profuse diarrhea and weakness. For the next few days the patient continued to have the severe diarrhea, and the pain in the abdomen, if anything, became worse and this condition has been running along with the pain increasing, although diarrhea at the present time is not quite so bad as it was a few days ago.

April 13, the patient first noticed that his legs began to feel weak.

April 15, he noticed that the weakness was increasing and he was losing the use of his legs, ankles and feet, but he could still walk.

April 18, he could move his feet and ankles and legs, but they were very weak and he could not walk, and has never walked since. The weakness seemed to increase. Beginning April 24 the patient would wake up at night with a "pulling up" sensation of the legs. This condition lasted about ten days.

April 22, he noticed that his wrists, hands and fingers began to feel weak and three days later he had completely lost the use of his wrists, hands and fingers, and was unable to feed himself.

April 28, he became hoarse and in a very short time was unable to talk above

a whisper and had great difficulty in talking or trying to talk, as it was necessary to take deep inspiration and make forcible expiration to make a faint sound.

The patient stated that he had had some severe bilious attacks two years ago but had had none recently.

He had had the usual diseases of childhood and has had influenza, pneumonia, typhoid fever, malaria, Neisserian infection. Has had no operations or injuries.

He was married twenty-five years ago. He has one child living, two were born dead and two died of dysentery.

He has been employed by the Railway Company for seven years. Is employed at the present time as car oiler. He states that he has been having a cramping in the abdomen and for the last three months has been taking Jamaica ginger (one ounce three times a day after meals). During this time he states that he has taken ten or twelve bottles. The last was taken April 6, 1930.

He was examined on April 26, 1930, by Dr. M. L. Perry, who reported as follows:

"Tall well developed, well nourished man on stretcher. Unable to walk. Skin smooth and clear. No evidence of accidents or injury.

"Head normally formed. Templar arteries rather tortuous. Eye movements normal. Pupils react to light and accommodation. Fundi normal. Expression on two sides of face equal. Tongue protrudes in median line. Muscles of face react equally. Teeth and gums in poor condition. Throat clear. Fauscial reflexes present. Hears watch only on contact. Hears well in conversation. Neck long, thyroid and other glands not palpable.

"Chest: Expansion equal and good. Lungs negative on auscultation. Heart rate normal, 84. Apex beat poorly defined. Heart seems to be about normal in size. Heart sounds normal. B. P. 170/90.

"No tenderness, soreness or masses in abdomen. Abdomen reflexes are not elicited. Cremaster reflexes absent. Musculature of arms good but a little flabby. On flexing elbow strength seems much reduced, on extending elbow, seems normal. Hands in position of moderate wrist drop. Cannot extend wrist on forearm or finger on wrist. Can make a fist on left side, imperfect on right side. Grip greatly reduced, a little more reduction on right.

"Reflexes: Triceps right and left present and active. Biceps right and left absent. Supination and posterior forearm about normal.

"Musculature lower extremity normally formed, flabby. Lower extremity almost completely paralyzed. Can flex right knee slightly. Can abduct legs slightly. Patellar reflexes present but slightly reduced. Clonus, Gordon, Babinsky, Oppenheim absent. Soreness in calves of legs. Pressure on sciatic and popliteal nerves is felt. Nerves not enlarged and not tender. Plantar reflex is active when bottom of foot is stroked, the knees are flexed materially more than when patient is asked to bend them.

"Sensation pain touch, temperature and stereognosis normal.

"Mentality seems entirely clear.

"Two days ago (April 24, 1930) developed hoarseness and complains of secretion in throat. Also complains of a little difficulty on swallowing."

His urine was examined on April 13. It was found to be acid in reaction with a specific gravity of 1027 with no sugar or albumen.

A test of a twenty-four hour specimen of urine made on April 30, showed it to be negative for arsenic and also negative for lead.

A blood examination made on April 13 showed 12,400 W.B.C. with 60 polynuclear neutrophiles and 40 lymphocites. Another examination on April 28 showed 6,000 W.B.C., 80 per cent hemoglobin, 4,770,000 R.B.C., 69 polynuclear neutrophiles and 31 lymphocites. An examination on May 8 showed 9,400 W.B.C., 85 per cent hemoglobin, 4,720,000 R.B.C., 77 polynuclear neutrophiles and 24 lymphocites.

An examination of spinal fluid was made on April 30 by The Lattimore Laboratories. The report states a cell count is 11 per c.m.m. No bacteria are found

on direct smear or from culture. Colloidal gold 0000000000.

Wassermann test was reported negative by The Lattimore Laboratories on April 25, was also reported negative by the Kansas State Public Health Laboratory on April 30.

B.L.W., sheet metal worker, white male, aged 48, admitted April 25.

Patient gave history of having had a bad cough and cold a great deal of time during the past year, which he thinks is partly due to fumes of sal ammonia and muriatic acid, which are used in his work as sheet metal worker.

On April 1 he caught a severe cold and went to bed at Mulvane Hospital April 4, 1930. At this time he had a profuse expectoration and also pain in the chest in the precordial region. On April 8 cold and pain in chest had subsided. Out of bed, pain in calves of legs developed and had ankle drop. The following day, April 9th, could not use legs on account of weakness, also had pain in legs when he attempted to use them. Six days later, April 15th, he lost the use of arms, forearms and hands during the night. Two days later, April 17, he could use arms and forearms.

He entered the hospital on April 25 in about the same condition he had been for a week past. He had no pain, numbness or tingling of hands or feet. Said arms and legs felt normal but had no strength. States that on Christmas he drank one-third of half a pint of corn whisky and has drank a little home brew since.

The record of his physical condition is as follows:

Good sized muscular man, well nourished, on stretcher, unable to walk. Skin clear except light bronz spots on body of long standing (tinia versicolor). No evidence of accident or injury. Head normally formed. Facial expression normal. Eye movements normal. Pupils react promptly. Fundi normal. Tongue protrudes in median line. Facial muscles respond equally. A few bad teeth, gums bad. Throat clear and faucial reflex present. Neck short. Thyroid and other glands not palpable.

Chest expansion equal and good. Heart and lungs negative. Heart rate 80. B.P. 130/85.

Abdomen: Normal formation. No masses or tenderness. Arms normally formed, well muscled but flabby. Strength against resistance good in extension of forearm and reduced in flexion of forearm. Hands in position of moderate wrist drop. Extension of hand on forearm very much reduced especially right. Cannot make closed fist either hand. Grip well.

Reflexes: Triceps normal. Biceps absent. Forearm reflex active on both sides. Legs partially paralyzed, can bend each knee limited extent. Abduction fairly good. Adduction of legs very limited. All motion in feet absent. Patellar reflexes present each side considerably reduced. No clonus, plantar reflex present. Strength against resistance very much reduced. No Babinsky, Oppenheim or Gordon. Popliteal nerves not enlarged, quite tender on right side, less so on left. Complains of even slight pressure on calf muscles. Thigh muscles not sore. Ulnar nerve not sore, rolled under fingers.

Sensation normal throughout. Mentality not affected.

Examination of urine on April 26 showed that it was acid in reaction with a specific gravity of 1020. There was no albumen or sugar. Tests of a twenty-four hour specimen of urine made on April 30 were negative for arsenic and negative for lead.

Blood examination on April 28 gave 12,800 W.B.C., 75 per cent hemoglobin, 4,920,000 R.B.C., 70 polynuclear neutrophiles, 28 lymphocites. Another examination on May 8 showed 8,600 W.B.C., 75 per cent hemoglobin, 4,990,000 R.B.C., 70 polynuclear neutrophiles, 30 lymphocites.

Wassermann reaction was reported negative by The Lattimore Laboratories under date of April 26 and was also reported negative by the Kansas State Public Health Laboratory under date of April 28, 1930.

The spinal fluid was examined April 30 by The Lattimore Laboratories and the following report submitted:

Cell count is 6 per cu. mm. No bacteria are found on direct smear or from culture. Colloidal gold, 0000330000.

## The Cause of "Jake" Paralysis

E. R. MILLIS, M.D., Kansas City, Kan.

Read by special permission before the Kansas Medical Society, Topeka, May 6, 7 and 8, 1930.

This will simply be a preliminary report on the isolation of the active principle of Jamaica ginger poison. Since the first few cases of Jamaica ginger paralysis, we have all been more or less interested in determining the exact cause. While there are reports that some of the people paralyzed have not been drinking "jake," it is extremely uncertain whether or not that was the case. Also it is possible that we may have an epidemic of an apparently similar disease concurrently. The large percentage of patients knew definitely that Jamaica ginger was the cause of their illness. Our first thought of course was that some ingredient had crept into the mixture through bootleg channels. However, my experiments have shown that it is an active principle in the ginger root.

The method used in securing the active principle thus far is by fractional distillation. The aldehydes which are present in all alcohol evaporate at a much lower temperature than the alcohol itself. It is impossible to use absolute alcohol for manufacturing purposes, on account of the prices being prohibitive. By a fractional distillation we have brought over with the aldehydes the active principle of the poison. Less than one-half of one per cent of the solution comes over under this method. Apparently the chemical that does the most damage is extremely volatile. Our experiment has shown that if the container is left open to the air or exposed to the light, a few hours exposure lessens its potency very greatly.

We have injected guinea pigs with the genuine Jamaica ginger and there was no reaction other than that caused by the alcohol. We have injected pigs with the tails or end product of the distillation and had no reaction.

The heads or aldehydes are the first product over in the process of distillation. When a few drops of this is injected into the pigs, within a very few minutes paralysis develops. The amount of paralysis will depend entirely upon the size of the dose given. Ten drops is usually fatal within less than forty-eight hours.

Ginger, according to the United States Dispensatory, is the dried rhizome of Zingiber officinale Roscoe (Family of Zingiberacae) known in commerce as Jamaica ginger, Cochin ginger, and African ginger. The outer cortical layers are often either partially or completely removed. Ginger yields not less than two per cent non-volatile ether-soluble extractive and not less than twelve per cent of cold water extractive. There are about seventy species of the genus Zingiber, the commercial ginger being obtained from Zingiber officinale. This species is a native of tropical Africa, but now extensively cultivated in tropical countries of both the Eastern and Western Hemispheres. It has been introduced into southern Florida where it thrives in rich soil and partial shade. The uncoated ginger of the East Indies resembles Jamaica, but is darker, being gray rather than whitish. As the Jamaica brings a higher price than even the uncoated East India production, the latter is occasionally altered to simulate the former. This is sometimes done by coating the exterior with calcium sulphate or carbonate, sometimes by bleaching with the fumes of burning sulphur or in other ways, by which not only the exterior but also the internal parts are rendered whiter than in the unprepared root. Commercial gingers are known as "scraped," "decorticated," and "uncoated." The "scraped" gingers are those from which the cortex has been removed in whole or in part by peeling, as seen in the Jamaica and in some Cochin and Japanese varieties. In the coated gingers a portion of the outer natural layers are retained as in the African, Calcutta and Calicut varieties. Bleached and unbleached gingers are also distinguished, the former being lighter in color due to careful washing or special treatment. The U. S. P. No. 10 recognizes only the Jamaica, African and Cochin

gingers. Of these, the Jamaica is the most aromatic and the African the most pungent.

CONSTITUENTS OF GINGER

The peculiar flavor of the root appears to depend on the volatile oil. Its pungency is due to a yellowish liquid called gingerol. This is a mixture of homologous phenols of the formula $C_{16}H_{26}O_3$. $(CH_{20})n$. Zingerone, $C_{11}H_{14}O_3$, is crystalline and has a sweet odor and an extremely pungent taste; it is chemically related to vanillin, and is formed when gingerol is treated with baryta water. The pungency of gingerol, in contrast to that of capsicum, is destroyed by heating with alkaline hydroxides. The volatile oil is yellow with a sp. gr. of from 0.875 to 0.890 and an optical rotation of about —25 degrees to —45 degrees (the Japanese ginger is said to yield an oil which is dextrorotatory). It consists largely of a mixture of terpenes, camphene, phellandrene and a new sesquiterpene, which the discoverers, von Soden and Rojahn call Zingiberene. There is also some citral, cineol and borneol in the oil. There is present in the root a considerable proportion of starch.

VOLATILE OILS

These are sometimes called distilled oils, from the mode in which they are usually procured; sometimes essential oils, from the circumstance that they possess, in a concentrated state, the organoleptic properties of the plants from which they are derived. The word essence, is used in some countries to designate the volatile oils themselves, but in America this word has unfortunately been largely applied to the alcoholic solutions of the volatile oils, usually called the spirits, and the word soluble essence has been used to describe hydroalcoholic solutions of volatile oils which possess the property of mixing clear with water.

The terms Aetherolea is used in some countries to distinguish the volatile oils in general from those which are produced by destructive distillation, like oil of amber, oil of cade, oil of tar, etc., which are given the collective name pyrolea (pyroligneous oils).

They exist in most odoriferous vegetable tissues, sometimes pervading the plant, sometimes confined to a single part; in some instances contained in distinct cells, and partially retained after desiccation, in others formed upon the surface, as in many flowers, and a third in the rind of its fruit. In a few instances, when existing in distinct cells, they may be obtained by pressure, as from the rind of the lemon and orange; but they are generally obtained by steam distillation. Some volatile oils, as those of bitter almond and mustard do not preexist in the plant tissue, but are produced by a chemical reaction which takes place between certain constituents in the presence of moisture.

The volatile oils are usually colorless when freshly distilled, or at most yellowish, but some are brown, red, green, or blue. There is reason, however, to believe that in most instances the color depends on foreign matter dissolved in the oils. Septimus Piesse succeeded, by the fractional distillation of certain volatile oils, in separating a blue liquid, which by repeated rectification, he has obtained quite pure.

In this state it has the sp. gr. 0.910, and a fixed boiling point of 302.3 degrees C., and yields a dense blue vapor having peculiar optical properties. He named this principle azulene, and believed that upon it depends the blueness of volatile oils wherever existing. The yellowness of the oils he ascribed to the resin resulting from their oxidation, the green and brown colors to a mixture of azulene and resin in various proportions. The formula of azulene he gave as $C_{16}H_{20}O$. Gladstone named this blue coloring constituent caerulein, and stated that it contains nitrogen and is colored green by acids and alkalies.

Azulene was later investigated by Sherndal, who assigns to it the formula $C_{15}H_{18}$, which places it in the class of hydrocarbons. He states that it yields a dihydrosequiterpene, $C_{15}H_{23}$, upon reduction and believes it to be related to alpha gurjunene, $C_{15}H_{24}$, a tricyclic compound existing in gurjun balsam.

The volatile oils have a strong odor, resembling that of the plants from which they were procured, though generally

less agreeable. Their taste is hot and pungent, and when they are diluted, is often gratefully aromatic. The greater number are lighter than water, though some are heavier; their sp. gr. varies from 0.847 to 1.17. They vaporize at ordinary temperature, diffusing their peculiar odor, and are completely volatilized by heat. When distilled alone, they nearly always undergo partial decomposition. Heated in the open air, they take fire and burn with a bright flame attended with much smoke. Almost all of them are optically active, and advantage may sometimes be taken of this property to detect adulterations of one of these oils with another. The refractive index is another physical constant that is being studied in connection with volatile oils, but the accumulation of data is not yet sufficiently large to give the factor much value as yet. Exposed at ordinary temperatures, some of them absorb oxygen, assume a deeper color, become thicker and less odorous, and are ultimately converted into resin. This change takes place most rapidly under the influence of light. Before alteration is complete, the remaining portion of oil may be recovered by distillation.

It is said that volatile oils which resinify and assume a turpentine odor, can be kept indefinitely by adding sodium bisulphite in the proportion of 50 grains to 1 pound. They can also be preserved by the addition of 5 per cent of a fixed oil, such as cotton-seed or olive oil.

### CLASSIFICATION

The volatile oils are sometimes hydrocarbons although with these are frequently associated alcohol or ketone-like bodies called camphors, and products of oxidation known under the general name of resins, and undoubtedly formed from the hydrocarbons. Phenols, aldehydes, esters, ethers, and sulphides are also represented. The hydrocarbons are generally known as terpenes, from oil of turpentine, which is taken as a type. Olea aetherea sine terpeno is the name proposed by Schweissinger for concentrated volatile oils made so by the removal of the non-fragrant hydrocarbon, and representing from two to thirty volumes of the oil of anise, cassia, fennel, ginger grass, mentha crispa, mentha piperita, cloves, sassafras, and star anise; two and one-half volumes of the oil of bergamot, caraway, and lavender; four volumes of cumin and rosemary; five volumes of thyme; six volumes of coriander; eight volumes of calamus; ten volumes of absinthe; twenty volumes of juniper; thirty volumes of angelica, lemon and orange. It is asserted that these concentrated oils are more permanent, more soluble in alcohol and in water, have a finer odor, and are of constant composition, thus enabling the specific gravity and boiling point to be used as tests of purity. They should be kept in the dark. Under the name of "terpeneless volatile oils," similar products can now be found in the market especially for use in perfumery and in the manufacture of flavoring extracts; they are undoubtedly superior to the ordinary volatile oils in odor and strength, but are not medicinally equivalent. Wallach, to whom much of our knowledge on volatile oils is due, divides the hydrocarbons into classes as follows:

1. True terpenes, of the formula $C_{10}H_{16}$, of which there are two main groups: (a) the terpene group, uniting with two molecules of haloid acid or four atoms of bromine; this group includes limonene, dipentene, sylvestrene, terpinolene, terpinene, thujene, and phellandrene, and its members boil between 175 degrees and 185 degrees C.; (b) the camphane group, uniting with one molecule of haloid acid or two atoms of bromine; this group includes pinene, bornylene, camphene, and fenchene, and its members boil between 151 degrees and 161 degrees C.

2. Hemiterpenes, of the formula $C_5H_8$, such as isoprene.

3. Polyterpenes, such as cedrene, cubebene, cadinene, etc., of the formula $C_{15}H_{24}$ (sesquiterpenes); colophene, of the formula $C_{20}H_{32}$; and caoutchouc, of the formula $(C_{10}H_{16})x$.

Hydrocarbons other than those of the terpene class, or derivable from them, occur very sparingly in the natural oils. Thus there is of the paraffin series of saturated hydrocarbons, heptane, $C_7H_{16}$, occuring in the oil from the Pinus sa-

biniana, or California digger pine, and solid hydrocarbons of the same series in oil of rose, and probably in oils of wintergreen and sweet birch. Of the benzene series there is a single representative in cymene, $C_{10}H_{14}$, found in the oils of the Thymus and Monarda species.

In addition to these naturally occurring hydrocarbons, there is a class of artificially prepared hydrocarbons known as hydroterpenes, such as dihydrodipentene from dipentene, menthene and carvomenthene from menthol and carvone.

The terpenes in general are practically insoluble in water, but soluble in alcohol, ether, chloroform, benzene, petroleum benzin, and the fixed and volatile oils.

We now come to the point of determining whether or not the paralysis portion of the Jamaica ginger is a combination of aldehydes with adulterants that have slipped into the ground root or whether or not it is one of the known constituents of the ginger. This will require further study in order to bring out the physicological action of each one of these constituents about which there is apparently very little known at the present time. I have doubts that we are on the verve of discovering any new chemical compound. It would seem more logical to suppose that one of the volatile principles that has had ample opportunity to escape during the process of aging, or break down into a harmless compound in the past; when ginger was used solely for medicinal purposes, were the cause of the paralysis. Nowadays apparently, the time has been too short between maker and drinker for these volatile essences to evaporate.

I have a few guinea pigs here and will proceed to inject them with varying doses, so that you may observe the rapidity with which this product works. We have held an autopsy on many of the pigs, but only to determine the cause of death and in the cases that we examined, we find a ruptured heart showing an acute dilation of the right side.

———R———

"Uncle," asked the pride of his doting relative, "are you still growing?"

"No, Johnny, why do you ask?"

"'Cause the top of your head sticks up beyond your hair."

## An Epidemiological Investigation of Jamaica Ginger Paralysis Cases

EARLE G. BROWN, M.D., Topeka

Secretary, Kansas State Board of Health

During the latter part of February, the public press carried news items from various sections of the state, relative to the prevalence of numerous cases of paralysis which had developed following the use of Jamaica ginger extract as a beverage. Subsequently, a few case reports were received by the State Health Department, although rules and regulations provide for immediate notification if unusual numbers of cases of uncertain or indefinite etiology develop. Therefore, in order to determine the actual number of cases of paralysis which had occurred, a letter was addressed to each city and county health officer on May 2, requesting him to immediately report the total number of cases that had occurred in his city or county. Replies were received from each of the health officers and 690 cases were reported. Supplemental reports received from the health officers indicated that a majority of the patients afflicted had used Jamaica ginger extract as a beverage for a number of years. For this reason, it was our opinion the paralysis had not resulted from the use of the ginger alone. "It soon became evident, therefore, that the condition must have resulted from some unknown poison or from some known poison whose pharmacologic action was so altered through the ginger or the alcohol, or both, as to render it unrecognizable, which poison in some way got into a manufactured lot of so-called U. S. P. fluid extract of ginger at a relatively recent date."

In order to determine the relationship of ginger to the development of the paralysis, case histories were secured of 113 patients. These histories were secured and the patients examined by representatives of the state, city and county health departments and physicians in private practice co-operating with the state health department. The period of onset ranged from February 10 to April 5, the greater number occurring during the last two weeks of February and the first two weeks of March.

Case reports were received as follows: City of Wichita, 402 and Sedgwick County, 23; Butler County, 64; McPherson County, 30; Cowley County, 22; Saline County, 19; Lincoln County, 15; Norton County, 14; Marion County, 11; Sumner County, 9; Ellsworth, Kingman and Russell counties, 8 each; Ford County, 7; Reno County and City of Hutchinson, 2 each; City of Topeka and Shawnee County, 2 each; Montgomery County, 4; Harvey County, 4; Clay and Barber counties, 3 each; Jewell, Osage, Morris, Lyon, Elk, Wilson and Rush counties, 2 each and 1 from each of Clark, Cloud, Crawford, Bourbon, Labette, Meade, Mitchell, Pottawatomie and Rooks counties.

All of the patients interviewed were of the white race with one exception. It is believed this ratio was approximately the same for the total of reported cases.

The great majority of patients afflicted were males, the ratio being approximately twenty to one. Of the 113 patients interviews, five were women and ranging between nineteen and twenty-nine years of age. The age of the youngest male reported was given as seventeen years. One hundred of the 108 men were over thirty years of age, seventy-two of them in the age group between thirty and forty-nine years.

Fifty of these patients admitted they had used Jamaica ginger only, as a beverage, while fifty-nine stated they had used Jamaica ginger, bootleg whisky or alcohol. One patient stated he had used only alcohol and three denied the use of Jamaica ginger or other alcoholic substance as a beverage. One of these men, however, did admit he had used one teaspoonful of Jamaica ginger extract for the treatment of what he termed a "stomachache" and a second admitted the use of a cup of ginger tea for the treatment of a stomach disorder. Only two of the patients interviewed, therefore, did not admit having used some form of ginger previous to the development of the paralysis.

The period of onset of the paralysis following admitted use of the ginger extract ranged from two days to more than twenty-one days. The average time appeared to be about fourteen days. Histories were secured from nine patients who stated they had last used Jamaica ginger more than twenty-one days before the first symptom developed. In many of the cases, nausea, vomiting, abdominal pain and diarrhea occurred. This condition usually lasted only one or two days.

Only seven of the patients stated the paralysis had not interfered with the performance of their usual duties. Although unable to work, because of the paralytic condition, thirty-seven had not been confined to bed. All other patients, according to information received, had been confined to bed for periods varying from one to twelve weeks; fifty-six averaging approximately five weeks confinement to bed at the time the histories were secured.

The symptoms and physical findings were remarkable in their uniformity. The quantity of Jamaica ginger consumed, apparently was not a deciding factor in the development and extent of the paralysis. As previously stated, one patient gave a history of having used a single teaspoonful of the extract, yet developed a definite paralysis of both legs with foot drop and partial paralysis of both forearms and wrist drop. Almost without exception, when a patient was asked as to what symptom he noticed first, he would reply by taking hold of the calf of his leg and saying "cramping pains in here." In the majority of cases, the "cramping condition" was present from two to five days before the paralysis developed. Many patients stated they realized paralysis had occurred when they were unable to move their toes and their "feet flopped" when they attempted to walk. Patients who developed paralysis of the arms and hands complained of similar "cramping pains" in the muscles of the hands and forearms, although of lesser degrees. These pains occurred on an average of seven to ten days after the muscles of the legs were attacked. Upon examination, the disability of the hands and forearms was never so marked as in the feet and legs.

Smith has described the symptoms of a typical case: "Clinically the victims

presented bilateral wrist drop and foot drop of varying degrees of severity. The milder cases could get about with the aid of canes or crutches; the severer cases were bed-ridden and in many instances were unable to feed themselves. The paralysis in the upper extremities has not been seen to extend beyond the elbows, and in the lower extremities the thigh muscles were seen to be involved in the more advanced cases. There are no sensory disturbances, no impairment of tactile, pain, or temperature sensations; the superficial reflexes are normal; the spincters are normal; there are no visual disturbances; and there is no evidence of involvement of the cranial ganglia or nerves. In brief, the clinical picture is uniformly that of a flaccid paralysis for the most part of the distal muscles of the lower and upper extremities, clearly pointing to involvement of the lower motor neuron remarkably localized to the lower lumbar and lower cervical regions of the cord. Indeed, the only physical sign that in our experience presented any degree of inconstancy is the knee jerk, which has been found diminished or absent in the severer cases, as one would expect, normal or nearly normal in the milder cases and markedly exaggerated in some of the milder ambulatory cases."

Examination of numerous patients showed the condition was not a pure alcoholic neuritis. Poisoning from arsenic, lead and other heavy metals was soon eliminated as a possibility. There remained then the possibility of poisoning from some adulterant contained in either the ginger, or alcohol, or both. Many samples were collected by representatives of the state health department and examined in the Food and Drug Laboratories of the department. Reports indicate that no substance was found in the alcohol which would account for the paralysis, but some compound was found in the ginger which as yet has not been identified.

The United States Public Health Service made an investigation of the "epidemic" in several different states and also collected samples of the suspected ginger extract which were examined at the Hygienic Laboratory. Smith who made a personal investigation of numerous cases and was in charge of the Pharmacological and Chemical studies recently drew the following conclusions in a preliminary report:

"1. Adulterated gingers with a reasonably certain or highly probable history of paralysis in man have yielded distillates, upon saponification and subsequent acidification, giving a positive reaction for phenols; while unsuspected adulterated gingers, as well as U.S.P. fluid-extract of ginger, treated similarly, failed to give such a reaction.

"2. Suspected adulterated gingers have invariably proved toxic in rabbits in moderate doses; death, which is due to respiratory paralysis, is preceded by a symptom complex resembling very closely in its essentials, though not absolutely, systemic phenol poisoning. Unsuspected adulterated gingers in large doses, as well as U.S.P. fluid extract of ginger, failed to produce such effects.

"3. All adulterated gingers examined, including the suspected ones giving a positive reaction for phenols, proved practically uniformly harmless in monkeys. A few experiments on dogs were likewise essentially negative.

"4. Chemical and pharmacological evidence indicate that the phenolic substance in the suspected gingers is a stable combination of phenols, probably in the form of a phosphoric acid ester or some related substance, which resists hydrolysis and requires drastic treatment with alkali and heat to effect complete saponification. The pharmacologic experiments furthermore indicate that this stable phenolic compound breaks down with great ease in the rabbit and apparently not at all in the monkey. The few observations we have in the dog show that it, too, is unable to liberate the phenols from this firm combination.

"5. The precise relation of this phenolic compound either by itself or in combination with the other ginger constituents to the multiple neuritis in man is as yet not clear. Before we can be certain of the etiologic relationship it will be necessary to find means of reproducing the human disease in animals more

faithfully than we have been able to do so far. The remarkable difference in species susceptibility we have observed tempts one to venture the suggestion that as regards susceptibility man may stand in some intermediary position between the rabbit at one extreme and the monkey at the other. Until some satisfactory explanation of this difference in species susceptibility becomes available, the suggestion may be considered as purely speculative. We may express the hope, however, that with more chemical information on this phenolic compound and a better knowledge of its action in the animal body its etiologic relationship to the human disease may become more apparent."

In a communication received under date of August 20, the following statement was made: "The exact nature of the pharmacology of the compound which has been found uniformly present in suspected ginger and absent in unsuspected ginger is as yet unknown. From its chemical behavior it appears to resemble a phosphoric acid of ester of one of the cresols. Its resistance to heat, the strong alkali and extreme heat required for its saponification, and the fact that phosphate has been found in the suspected gingers, would make it very probable that it may indeed be the ester suggested. Further studies of the subject are being continued by the Public Health Service."

Four deaths had been reported to August 1.

REFERENCE

Pharmacological and Chemical Studies of the Cause of So-Called Ginger Paralysis, (A preliminary report). Public Health reports, July 25, 1930, Volume 45, Number 30, pages 1703-1716.

## Pyelitis

O. W. Davidson, M.D., Kansas City

Read before the Wyandotte County Medical Society, April 1, 1930.

If we look in Dorland's Medical Dictionary for a definition of Pyelitis, we find the following explanation:[1]

"Inflammation of the pelvis of the kidney. It may be due to renal calculus, to extension of inflammation from the bladder, or to stagnation of the urine. It is attended by pain and tenderness in the loins, irritability of the bladder, remittent fever, bloody or purulent urine, diarrhea, vomiting and a peculiar pain on flexion of the thighs." It is clearly illogical to assume that pyelitis is confined within definite anatomical lines. However, for the purposes of this paper, we will assume pyelitis to be the nonsupperative types of pyelonephritis.

HISTORY

The presence of pus in the urine has been recognized as the result of a nephritic infection since the time of Hippocrates, Galen and Aetius, but it was not until 1837 that Royer[2] recognized and described pyelitis as an entity. Little more progress was made until 1894, when Escherich[3] thought the condition was limited to girls and considered pus in the urine due solely to cystitis. The present knowledge concerning pyelitis has been acquired in the last twenty to twenty-five years.

Due to the time limits placed upon this paper, it will be impossible to discuss the subject thoroughly, so we must be content to mention the more important factors which we are called upon to deal with so frequently, and all too often considered so lightly.

MORBID ANATOMY

Osler[4] states that, "In the early stages of pyelitis, the mucus membrane is turbid, somewhat swollen and may show ecchymosis or a grayish pseudo-membrane. The urine in the pelvis is cloudy and on examination numbers of epithelial cells are seen."

In calculous pyelitis, there may be an extension of a suppurative process into the kidney substance causing a pyelonephritis, or more extensive destruction producing dilatation of the calyces with atrophy of the kidney substance and finalily a pyonephrosis.

Tuberculous pyelitis follows a similar course except that the destruction usually begins at the apices of the pyramids.

ETIOLOGY

An infection is under consideration, therefore this implies growth of organisms in tissues, this then requires proper type of seed and a fertile soil with suitable growing conditions.

It has been proven repeatedly that

bacteria pass through the kidney and if damage is done, recovery is so rapid and complete that postmortem reveals no damage.

Numerous types of bacteria have been found in the infected urine, although the varieties that show any preponderance at all are very limited. The allied colon bacilli are found in 85 per cent of the cases. Strapyhlococci 10 per cent and streptococci and *B. Proteus Vulgaria* 5 per cent.[5]

Helmholtz and Bowers[6] proved that it is necessary to have a particular strain of organism. In 1917, they found that they could produce renal lesions in 66 per cent of experimental cases on rabbits, by injecting intravenously, and in 11 per cent when injected into the bladder. When this strain was lost, it was 8 years until they obtained a strain from the urine of a child which produced lesions in 100 per cent of the experimental cases. It is quite generally accepted that some organisms have a predeliction for the kidney.

The soil and the suitable diminished resistance are produced by the parenteral infection or enteritis.[7]

There are three routes to the kidney by which the infection may travel; i.e. blood stream, lymphatics, ureters.

The organisms circulating in the blood, as Rosenow has shown may have a predilection for the kidney. It is not the function of the kidney to kill these organisms, but rather the duty of the spleen, liver and lymphatics It is still an open question as to whether the kidneys can eliminate live virulent bacteria without being injured. In many acute infections, typhoid, pneumonia, etc., the specific organism has been recovered.

It has been shown experimentally that infection could spread by direct extension from neighboring organs by way of the lymphatics, but it has never been proven that such has happened. The preponderance of opinion today, however, is that infection of the renal pelvis is by the ascending route.

Deductions that Helmholtz and Bowers made from their work was that involvement of the bladder was primary and upper tract infection is brought about by ascending infection from the bladder.

Although, proven in several instances, it is not entirely accepted that renal pelvic infection extends by way of the ureteral lymphatics.

Undoubtedly the ureteral route is of greatest importance in the upper urinary tract infection. Hindman points out that unless we accept the theory that certain organisms have a particular affinity for the kidney it is difficult to explain why infections begin without obstructions.

Hunner[9] substantiates the experimental work of V. C. Dand, also Beeler and Helmholtz. He believes that cystitis precedes pyelitis and in 100 per cent of his cases he found a focus of infection and ureteral stricture. He quotes Dr. M. Schreiber whose work on Cadavers is not yet published, stating that in 12 per cent of the cases there are lesions which conform to our ideas of stricture, i.e., "a thickening of the ureteral wall sufficient to cause dilatation of the tract above," a temporary thickening enough to cause stasis can result when the primary bladder infection causes infiltration and edema of the bladder wall, resulting in partial closure of the ureteral os. If there is obstruction enough to produce stasis, decomposition of the urine begins and infection is an early result, then pyelitis follows.

Eisendrath and Shultz[10] present further evidence that infection can travel upward with partial obstruction. Kretchmer,[11] Thomas[12] and Birdsal, Lawsley and Butterfield,[13] C. K. Smith[14] and others have demonstrated that pyelitis has been associated with congenital malformations in the kidneys, ureters or bladder. Congenital anomalies are much more prevalent than once thought, and include abberant renal artery to lower pole of kidney over which lower part of pelvis may be hung producing some obstruction; double ureters, abnormalities in placement of ureteral opening into bladder, etc. Then too there are the pathological conditions of calculi, tumor or extra urinary tract conditions that by pressure or tension may produce obstruction to urinary flow.

Eberbach[15] states that infections of the kidney are secondary to some focus

of infection, that such infection tends to be self limited, but persists if there is obstruction to urinary drainage and tends to reinfection.

OCCURRENCE

Pyelitis or pyelonephritis is the most common lesion of the genito-urinary tract. In children under two years of age, pyelitis is not uncommon and is about equally divided between the sexes. In later infancy, pyelitis is at least twice as common among girls as boys.[16]

In obstetrics pyelitis is met with as a frequent complication of pregnancy. Pugh, in 1927, emphasized the fact that the majority of his patients having pyelitis during pregnancy gave a history of kidney infection in infancy or at some early time.

The reviews by Dr. Eugene Dozsa[17] present the facts that obstruction plus infection are always the causative factors, he states that the majority of pyelitis in pregnancy cases occur in the primipara, and offers as a suggestion the increased inter-abdominal pressure as offered by the less relaxed abdominal muscles.

Some evidence has been given that proves hypertrophy and hyperplastic changes in the low segments of the ureter, similar to the lower segment of uterus. Hofbauer thinks this is sufficient to produce obstruction.

There is considerable speculation as to why the right ureter is so much more frequently involved than the left. Duncan found the right ureter dilated in 100 per cent of his cases in both primipara and multipara and the left 66 per cent and 77 per cent respectively.

Post operative cystitis is another type of insult and Cabot's work at the University of Michigan proves the value of emptying the bladder at regular ten hour intervals, rather than allowing over distention with compression of the mucosa blood supply necrosis and cystitis, which if we are to believe these various works antedates pyelitis.

There is another type of pyelitis that is seldom mentioned, known as pyelitis follicularis. Hundley and Carson[18] report three cases and make mention of the rarity of these cases reported in literature.

This type is very difficult to diagnose and is found most frequent at autopsy or operation on kidney. It is felt by some that pyelitis follicularis with its lymphoid hyperplasia and associated vascularity may be the cause of one type of painless hematuria which has heretofore been classed as essential hematuria.

SYMPTOMS AND DIAGNOSIS

The diagnosis of pyelitis rarely requires cystoscopy, unless it is necessary to differentiate from some complicating intra-abdominal acuteness.

The onset is sudden with chills, sweats, malaise, wide variations in temperature, usually an accompanying cystitis of varying intensity. There may be attacks of pain on the affected side not reaching the severe agony of renal colic. There is likely to be tenderness on pressure or ballotment of the kidney and possibly tenderness along the affected ureter.

The urine becomes turbid and contains pus cells, some mucus and occasional red blood cells, it may be acid or alkaline and usually shows a high degree of albuminuria compared to the pyuria. Not withstanding the fact that renal pelvic cells and bladder cells are both of a transitional type, it is true that in pyelitis these tailed cells are of distinctive importance, for in cystitis alone long searching is necessary to find this type of cell.

The attacks of pain, fever, chills, etc., may be of an intermittent nature. Coincident with these attacks of pain a tumor mass may be felt in the side, demonstrating a retention. During this stage the urine voided may appear quite clear and free from the pelvic type of cells.

With the release of this retained urine the tumor mass disappears as does the acute pain in the side, the patient voids urgently and frequently large quantities of turbid urine, containing many pus cells and renal pelvic cells.

It is scarcely necessary to try to outline symptoms or diagnosis of the more chronic types, since these chronic cases are really not strictly pyelitis infections, but involve more complicated strictures.

TREATMENT

Broasch and Cathcart[19], in a study of over two thousand cases, bring out an interesting statement that in treating chronic infections of the upper urinary tract by all methods, only one-third the patients get well, one-third improve and one-third grow progressively worse.

Foci of infections, particularly of the ears, nose, sinuses, throat, teeth and intestinal tract should be cleared up, as the patient's ability to resist and overcome infection depends largely upon his general health.

The urinary organs may be given every opportunity to function normally and throw off the bacteria but it is the duty of the body tissue to destroy the bacteria.

Treatment falls quite generally into two groups i.e., medical and surgical.

Medical treatment according to the literature is quite variable and includes even the use of neo salvarsan, transfusions and reaction from foreign protein. However, diet correction, forcing fluids, rest and alkalinization have been used for over a century. The use of alkalies as explained by Helmholtz, may prevent absorption of toxic products, but the chief value is its diuretic action. He also explodes the theory that there is any value in rapid changes from acid to alkali.

Methamine (hexamethylamine) or urotropin is probably the most popular drug. In order to insure an acid medium in which the formaldehyde is liberated it is frequently combined with acid sodium phosphate or ammonium chloride.

Urotropin is a drug as is hexylresorcinol which has given some degrees of success, yet little experimental support can be offered to substantiate these results.

The drug may produce kidney pain associated with albumen and red blood cells and should then be discontinued.

Mercurochrome has been used intravenously with probably more results against it than for it. Other drugs as salol, boric acid, methylene blue, acriflavin and others have been used with varying degrees of success. Sandalwood oil has been used to relieve symptoms in tubercular infections.

According to Wear[21] cystoscopy and catheterization becomes necessary only to produce more adequate drainage, and is indicated after conservative treatment of four to eight days if there are definite indications of remaining infection. He also states that he had never observed an infection of the renal pelvis of bacillary origin secondary to ureteral catherization when the mucus membrane was normal. There is little danger to instrumentation unless the mucosa is subjected to trauma sufficient to injure it.

Eberbach[15] states that in acute renal infections of pregnancy associated with chills and fever, it has been his custom to pass large ureteral catheters to the kidneys and that he has never seen harmful results come from it, on the contrary there is a rapid fall in temperature, relief of pain and marked general improvement.

Eisendrath in 1926, advocated the use of indwelling catheters in the more severe cases. This method is gaining popularity, it is frequently essential in severe cases with high temperatures or in the hydroureter or pregnancy cases. He has left them in place from two to fourteen days without damage to the ureter. The kidney pelvis can be drained, lavaged and antiseptics instilled. Catheters have been left in the ureters as long as 24 days.

The value of cystoscopic and pyelographic aid is in the diagnosis and treatment of pyelitis in children and is equally as important in children as adults.

Campbell and Lyttle reported recently a large series of cases studied at Bellvue Hospital. These men cystoscope from six to ten babies each week. They have found it possible to cystoscope a male patient ten weeks old. They have found that some congenital anomaly is relatively common and that 50 per cent of such anomalies were strictures of the ureter. One thing of great importance that every doctor should guard against and that is the treatment until the patient is symptom free and then drop the case. Before treatment is discontinued, the urine

should be negative repeatedly.

It is folly to expect potassium citrate or urotropin to cure pyelitis secondary to some anomaly producing obstruction. Many of these cases are relieved by dilatation and pelvic lavage.

Thus the treatment of pyelitis implies and understanding of the modes of infection, the types of infections, the limitations of medical treatment and the necessity of frequent co-operation with a urologist.

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## Head Injuries

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The management of head injuries has always been a perplexing problem, as the gravity of these cases does not depend upon the extent of the skull fracture, if present, but entirely upon the damage to the brain or its circulation. A great deal of advice on the care of head injuries has been offered but, as yet, the treatment has not been adequate enough to completely put the attending physician's mind at ease. The decision to operate these cases is a serious one and fortunately the prevailing opinion has leaned more to conservative treatment in recent years, although Abernathy[1] urged caution over a century ago.

The past two decades have produced more efficient means of combating the high mortality of head injuries, than any previous periods in the history of medicine, however Harvey Cushing[2] stimulated interest and subsequent research twenty-eight years ago, by his observations on the effect of trauma to the cranial circulation. Under Cushing's[2] influence Weed, McKibbon;[10] later Foley and Putnam[8] brought forth the effect of hypertonic solution on the circulation of cerebrospinal fluid. Temple Fay[5] performed ingenious experiments to demonstrate the effects of magnesium sulphate on cerebrospinal circulation by placing the drug in an isolated loop of intestine. Both series of investigations conclusively established the dehydrating effects of hypertonic fluids, whether given by mouth, rectum or intravenously. Peet's[9] work with hypertonic glucose was of extreme value because it lessened the toxic effects produced by saline solution, and was an additional aid in combating acidosis.

Following these valuable experiments, the neurologists and surgeons became more cautious in advising immediate decompression for cases of increased intracranial pressure and gradually the terrific mortality has been decreased. In spite of the lowered death rate there is still a tendency toward unwarranted surgery in head injuries, and an attempt will be made to present a plan of treatment which has been effective in reducing mortality still further.

CLASSIFICATION

It is futile to add further to Dowman's[3] comprehensive and complete classification of head injuries which is as follows:

(a) Massive brain injury, with evidence of rapid exhaustion of the medullary centers and death within one to several hours after admission.

(b) Definite evidence of middle meningeal hemorrhage.

(c) Simple or compound depressed

fracture, with localized brain contusion, with or without indriven bone fragments.

(d) Classic manifestations of rapidly increasing intracranial pressure which are well within the period of medullary compensation.

(e) Definite evidence of brain injury exhibiting no classic findings of acutely increasing intracranial pressure, yet of the type that experience has shown is liable to develop gradually increased intracranial pressure due to fluid accumulation.

(f) So called "concussion" with no evidence of gross brain damage.

(g) Depressed fracture of a mild degree, giving rise to no symptoms whatever.

(h) Scalp lacerations, without damage to underlying structures.

a, b, c, and h can usually be readily determined a short time after admission to the hospital.

However, the general condition of the patient must be considered before any drastic means of diagnosis or treatment are employed. Many a patient who has suffered a head injury is severely shocked and supportive treatment must be given immediately. Following an alteration in the circulation of the brain, however slight, there is a tendency to a rapidly increased pressure and severe brain damage from this pressure occurs within comparatively few hours after the accident. To prevent this irreparable damage a dehydration regime should be started before any other plan of therapy or diagnosis is begun. This can best be instituted by giving 40-60 c.c. of 50 per cent glucose intravenously and then, unless there is severe hemorrhage from scalp laceration, the patient should be put to bed, ice bags applied to the head and the body kept warm. Atropine gr. 1/150 has proved to be the most satisfactory stimulant, if indicated. The pulse, temperature, respiration and blood pressure should be taken every fifteen minutes and when the signs of acute shock have subsided, careful opthalmologic, neurologic and *x*-ray examinations can be made.

If there has been a fracture which caused bleeding or leakage of cerebrospinal fluid from the nose or ears the attending physician must avoid such meddlesome methods as syringing the nasal or aural cavities, because such practices are almost certain to carry infection into the cranial cavity. The custom of inserting adrenalin packs into the nares, as a means of stopping hemorrhage from head injuries, cannot be too strongly condemned because it is the forerunner of either meningitis or brain abscess. Cold compresses externally applied and general supportive methods are usually sufficient to quiet the patient enough so that hemorrhage is not profuse. If the individual becomes very restless it may be necessary to administer a sedative, preferably bromide or codeine, but never morphine as it is a respiratory depressant.

If a patient is unconscious, the depth of the coma and extent of paralysis, if present, can be determined by pressure in the supraorbital notch. A reflex contraction of the face and extremities follows this pressure and an attempt is made to push the examiner's fingers away. Even in coma the patient will take the paralyzed hand with the unaffected limb in an effort to remove this painful stimulus.

Spinal puncture and drainage, if the fluid is under increased pressure or contains blood, affords a means of determining, to some extent, the degree of trauma and a method for temporary decompression. The pressure should be taken with a water or mercury manometer and the readings carefully recorded. The attending physician must base his conclusion for treatment on the pulse, respiration, blood pressure and spinal fluid findings.

### TREATMENT

Massive brain injury is hopeless and little more than palliative methods can be employed. Drastic surgery is definitely contraindicated because it is of no avail.

Cases of middle meningeal hemorrhage can usually be recognized within a short time after admission and are evidenced by a contra-lateral hemiparesis or hemiplegia, hyperactive tendon reflexes and positive Babinski or Hoffman

signs on the affected side. These patients warrant immediate surgery if the general condition is suitable. However, localizing signs and medullary compression may occur simultaneously, and it is futile to operate unless the effects of the rapidly increased pressure can be reduced by dehydration. The choice of approach must be determined largely by the extent of injury and not infrequently it is necessary to turn a large bone flap rather than a simple trephine and decompression. Usually the operator finds a large extradural clot which on removal leaves an adequate exposure of the torn artery. Occasionally a linear fracture through the foramen spinosum will necessitate plugging of the foramen with bone wax. An experienced neurosurgeon seldom has difficulty in producing hemostasis but Dowman[4] advises ligation of the external carotid artery if the surgeon is not familiar with intracranial technique. The dura should be incised to ascertain the presence of subdural or subarachnoid clot, which, if seen, can be removed by gently washing the brain with physiological saline at body temperature. A rubber drain should be left in the wound for twenty-four hours.

Patients having simple or compound depressed fracture with localized brain contusion, are considered emergency cases but again caution must be stressed lest there be a tendency to hurriedly advise operation. Frequently a hematoma beneath the scalp will appear, on palpation, to be a depressed fracture and careful *x*-ray studies in conjunction with neurological evidence must determine the urgency of operation.

The classic manifestations of rapidly increasing intracranial pressure are drowsiness, a lucid interval followed by coma, convulsions and hyperactive reflexes. The pulse may be rapid, respiration shallow and the blood pressure elevated. Signs of medullary compression are a rise in blood pressure, a slow pulse and either a sudden rise or fall of body temperature. Temple Fay[6,7] aptly expresses the crux of this situation as follows: "The old edict, when the pulse pressure crosses the pulse, *decompress*, is now supplanted by *dehydrate*." These patients usually respond quite well to intravenous injections of hypertonic saline or glucose. The latter is preferable because it has the advantage of combating shock and acidosis. The urine should be carefully examined before giving large amounts of glucose intravenously. If not markedly contraindicated, the glucose may be repeated every four hours if necessary and when volume is desired it may be followed by 100 c.c. of physiological saline. Previously when progressive signs of intracranial pressure were present, in the absence of focal symptoms, it was the custom to perform a subtemporal decompression. However, a rigid dehydration regime has supplanted many operative indications with a subsequent decreased mortality.

Winkleman's[11,12] observations have shown the damaged absorptive mechanism due to a plugging of the Pacchinonian bodies and subarachnoid villi with blood, and an increased cerebrospinal fluid pressure. Pressure in a closed cavity produces destruction of the soft compressible brain substance, and this can be avoided only by prevention of a large production of cerebrospinal fluid, rather than attempting to compress an edematous brain. The causes of "concussion" without evidence of gross damage can be effectively handled by dehydration.

The scalp lacerations, without damage to the underlying structures, should be thoroughly cleansed with a strong germicide, foreign bodies removed, if present, and the lacerations sutured with silk or horsehair. Delayed healing and subsequent distress to the patient can be avoided by inserting a rubber drain for the first twenty-four hours.

Any patient who has had a severe enough injury to be dazed or momentarily unconscious, should have a careful *x*-ray, fundus and neurological examination before a definite diagnosis is made. Many cases of head injury which appear inconsequential when first seen, later become unconscious and not infrequently die a few hours after dismissal as a minor injury.

Patients having a fractured skull, with or without cerebral trauma, should be

kept in bed for at least ten days and then activities restricted for four weeks. These cases should be observed from time to time because it is not uncommon for a patient, who shows nothing on first examination, to develop signs of increased pressure such as headache, vomiting, convulsions, choked discs and motor or sensory loss. On exploration, a large subdural hematoma is found which is the result of slow venous oozing.

During the period of convalescence the fluid intake should be restricted because there has been a sudden change of the water balance and unless a low intracranial pressure is maintained cortical atrophy will ensue; thus the fluid intake must be rstricted to twenty ounces or less a day for at least three weeks. It is necessary to resort to spinal drainage as long as blood is present in the cerebrospinal fluid otherwise absorption is hindered and if brain damage results, the patient's chances of resuming his economic position are seriously endangered.

### POST TRAUMATIC COMPLICATIONS

Headache, epilepsy and mental deterioration are the most common sequelae of severe head injuries. Until encephalography was introduced it was seldom possible to determine the extent of brain damage following trauma. Unless there is a definite evidence of indriven bone fragments surgery has little to offer this unfortunate group of individuals. Dehydration over a long period of time and re-education are the sole means of aid in these cases and it is of the utmost importance that they be given every opportunity to restore themselves to their former place in society.

Hysteria, malingering and those worthy of consideration can be readily differentiated by careful neurological examinations aided by encephalograms when the issue is in doubt.

### SUMMARY

Head injuries are serious cases requiring deliberate judgment and diagnosis before deciding upon operation. Care in selecting cases for surgery and a constant effort at dehydration have been the chief factors in lowering mortality. Encephalography, in competent hands, has been a means of fairly determining the justice of compensation and the subsequent course of treatment in post traumatic complications.

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## Cesarean Section—Increase In Indications —Other Methods In Delivery

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Read before the Douglas County Medical Society, May 1, 1930.

I have become much interested for the past year or two in the use, advantage and consequent increase of cesarean section in selected cases. Polak, DeLee, and other prominent obstetricians comment on the evident lessening of the pelvic diameters of women. Even in Sweden, where for centuries childbirth was the easiest of any country in the civilized world, they are finding this true. I practiced for twelve years in a community of Swedish people, the first settlers being direct from that country. These older women were still having a birth each year, with very few complications, and easy times. Their daughters, however, can tell a different story, and now the grandchildren of that community find childbirth even more difficult.

Here, I am sure the same thing is the case, even more so. This brings us to the subject of prenatal care, and a careful measurement of the pelvis in primiparae, particularly. If you find the external

sacro pubic diameter to be 7 inches or less, you can look for trouble often, and be prepared to act, and action in my opinion in many cases, should consist in a well done cesarean. Some place, sometime ago, I saw the statement that county seat surgeons should never attempt this operation.

During the last two years I have seen at least twelve of these operations done here, and the mother and babe in all cases are living and doing well. So, I feel that in this community, at least, we can have this done with assurance of safety, and live babies as well as mothers.

Another pleasing thing noticed is the lack of birth injuries to the child, and consequently the immediate increase in weight and development in the baby. This was evidenced only last week, in the case of one of our local men, the baby gaining one-fourth pound in the first week. By the way, this was Dr. Chambers' second cesarean in the same woman, with live babies and good recovery of the mother, while at her first confinement, some ten years ago, three doctors tired themselves out with instruments, finally doing a podalic version, and besides getting a dead baby, tearing the woman clear to and through the rectum.

Cesareans are necessary for all times on this woman, on account of contracted pelvis, but the idea of once a cesarean always one, has not proved out in my experience. Some six years ago I found a young woman in the country with eclampsia. Brought her to the hospital, had Dr. M. T. Sudler operate, saved the baby and woman. Since then, her pelvis being normal for childbirth, and with prenatal care, careful checking up of urine, etc., she has been confined normally twice, the only thing done being to apply forceps as soon as the head was engaged and uterus dilated.

Another indication met in the past year was in a primpara, between thirty-five and forty, with very large fibroids, but very anxious to have a child. Two weeks before time expected she was operated, a live baby delivered by cesarean, then hysterectomy done at this time for fibroids. Result, a well woman, a fine child, which developed rapidly from day of operation, and a happy family.

Still another admonition has been never to do a cesarean after the membranes have ruptured, and repeated vaginal examinations made. This, of course, means nothing, but rectal examinations, and practically none of these are made outside hospitals.

Three months ago a woman was brought to the hospital by an out-of-town physician, with placenta previa, with the right hand and forearm clear outside vulva, where it had been pulled by another doctor, in the effort to do a version in the country. If ever you could look for infection you would expect it here. However, cesarean section was decided on, a surgeon called into the case, a rapid delivery done, with cross cut incision from side to side through the peritoneum over the uterus. Have seen this done before by Dr. Chambers, and believe it aids in preventing spread of any infection. Anyway both mother and child made a fine, uneventful recovery, and left the hospital in two weeks.

A young girl was picked up on the street, with eclampsia, illegitimately pregnant, vaginal examination done by another doctor, then turned over to the county. Cesarean done, with good recovery and a live baby.

September 1, 1929, after fighting a losing battle in a primpara, unable to get less than four plus albumin in urine, seeing her going into pre-eclamptic state, very edematous and in grave danger, although the pregnancy was only seven months advanced, we did a cesarean. Result was recovery of mother and a three pound, four ounce child, which went through a stormy two or three months, but which now is a well developed, healthy child.

These cases are cited only to show the end results of operation. Certainly, prior to that, in my experience at least, and with the forcible emptying of the uterus by hand or any other method except cesarean, we would undoubtedly have lost at least a part of the infants and perhaps some of the mothers. So, though

I hope and feel that you will not consider me an advocate of universal cesarean section, I also hope we can all see the sense and advisability of same for both mother and child in many cases well selected.

I feel that I should not close without adding a few remarks in regard to other means of delivery, for instance high forceps, which I consider more dangerous, both to mother and child than even cesarean section. I have never owned a pair of high forceps, and I hope never will. If the head will not come down far enough for me to apply my good old long blade Simpson forceps, which is the only pair of forceps I have ever owned, and knowing there is plenty of room in the pelvic outlet, podalic version beats high forceps for delivery, both for the mother's and baby's sake. And I always want the forceps ready to apply to the after coming head. We do need this procedure at times.

This paper is not intended as a plea to do anything to a woman who does not need it done. I might go on along the lines of pituitrin and many other procedures, but my object here is simply to urge the sensible use of what has been until recently considered a last resort, for the purpose of saving life, and prolonging it also, in carefully selected cases, which would not be possible and has not been done in the past.

We are fortunate in having men here who are, and have proved themselves, capable of doing this operation. Under the same conditions I am certain it can be done oftener than in the past, with good results.

## Insulin In Large Doses

Howard E. Marchbanks, M.D., Pittsburg

So much has been said about diabetic coma by Joslin and his co-workers, as well as by many other able diabetic workers, that I will not discuss the usual treatment or attempt to review the wealth of literature on the subject.

I do, however, wish to report an interesting case of coma in more or less detail to bring out two or three points in the treatment of this most needless accident.

The patient, an American school girl, was first seen by me, September 14, 1928. At that time she was fifteen years of age. She had an annoying pruritus about the vagina and rectum. Her periods had been irregular for the past nine months. She had lost fifteen pounds in six weeks. She complained of marked polyphagia, polydipsia, and polyuria. She was put immediately into the hospital where her tolerance proved her to be a moderately severe diabetic.

She was advised, on account of her youth, to start insulin at once so that she might save her tolerance and also carry on her school work more successfully. She flatly refused but said she would follow her diet. Her blood sugar stayed around 300 mg., so she was told she must take insulin or seek other medical advice. She took insulin for a few months with good success and felt well except she did not like to be stuck so often.

In June, 1929, she went to Kirksville, Mo., where she was treated for three months by an osteopath. During this period she took no insulin. She felt fairly well except for the pruritus, which returned soon after insulin was discontinued. She does not know what her blood sugar was during her stay at Kirksville. She returned home for school in September, 1929. She then consulted one of our local quacks who outlined some food for her to take. The amounts were not weighed but she took a diet comparatively low in carbohydrate. Her pruritus was better under this treatment than it had been with osteopathy. She attended school during the winter, doing fairly good work. In the early morning on March 27, 1930, she took sick with what her family thought was measles. She was very uncomfortable all day and at 8 p. m. she became unconscious. I was called by her physician at 11 o'clock. I advised him to give her 40 units of insulin at once and to bring her to the hospital. An hour later she was in Mt. Carmel Hospital, where her blood sugar was found to be 400 mg. per 100 cc. of blood. Her $CO_2$ was 5 volume per cent.

Forty more units of insulin were given on entrance. She was in profound coma. Her eyeballs were soft. Her pupils were regular and equal. They reacted sluggishly to light. Some cracks were about her mouth. The teeth were good, the tonsils out, and the skin dry, almost parched. There was labored breathing but not of the Kussmaul type. She was extremely restless, moving constantly about the bed. There was a marked pruritus about the perineum. The rest of the examination was essentially negative. Her temperature was 98°, her pulse 120, and her respiration 24.

She was given an enema on entrance. The stomach was lavaged with warm soda water. She was given 20 units of insulin, subcutaneously, every thirty minutes until five o'clock that evening. This made a total of 660 units of insulin that she had received in sixteen hours. She received 1700 cc. of 3 per cent glucose, subpectorally. She had 100 grams of glucose and 46 grains of sodium bicarbonate in 1040 cc. of water, intravenously. Caffein sodium benzoate in 7½ grain doses had been given every three hours. Some proctoclysis in the form of 5 per cent glucose had been given but only about 500 cc. retained.

Her blood sugar at this time was again 400 mg. and the $CO_2$ was estimated at 4 volume per cent. The $CO_2$ was so low in both of these examinations that the regular table for the Van Slyke did not have the reading and it had to be estimated. I am, however, definitely sure that the tests were absolutely correct because our technicians are running tests every day and their work is accurate. The carbon dioxids were not running low at that time, as they may do in the course of months unless great care is observed. I mention this, knowing that I will be questioned about the accuracy of the findings.

We gave her two more 20 unit doses of insulin and a 30 unit dose, subcutaneously, and then 40 unit doses with 23 grains of sodium bicarbonate, intravenously, every ninety minutes for four doses. Three minims of adrenalin were given every two hours. We had been catheterizing the bladder empty every two hours while she was getting insulin subcutaneously and before each intravenous dose of insulin. More than 2 per cent sugar had been present at all times. At 1:30 a. m. on the 29th, the urine was sugar free. At 3 a. m. sugar again appeared in the urine, so 30 units of insulin with 23 grains of sodium bicarbonate were given intravenously. At 5:30 a. m. the blood sugar was 118 mg. and the $CO_2$ was 16.4 volume per cent.

It had been 28.5 hours since I had first been called. She had been given 730 units of insulin subcutaneously and 190 units intravenously, a total of 920 units.

In the meantime she had received 3000 cc. of 3 per cent glucose, subpectorally, 150 grams of glucose, 184 grains of sodium bicarbonate in 1660 cc. of water, intravenously.

At this time the patient began to answer questions with some degree of accuracy. She was taking water and orange juice by mouth. By the next morning her $CO_2$ was 31.6 volume per cent while her blood sugar had reached the abnormally low figure of 28.9 mg. per 100 cc. of blood. The urine was now sugar free and remained sugar free. Neither was there albumin or casts in the urine.

By this time her measles had broken out in good shape. She had a very annoying cough. Her temperature, however, did not go over 101 degrees and her pulse 120. She left the hospital April 4, on the seventh hospital day, with a blood sugar of 110 mg. and her $CO_2$ was 52.4 volume per cent. Her diet on this date was C. 86, P. 53, F. 83.5. She was getting 55 units of insulin, daily. She took the insulin at 7 a. m., 2 p. m., 8 p. m. and 1 a. m. After April 10 the night dose of insulin was discontinued while the diet remained the same.

On May 16, 1930, her blood sugar was 62 mg. and her blood urea nitrogen was 13 mg. per 100 cc. of blood. The urine had been sugar free since the second hospital day. She had tested it before each dose of insulin. A twenty-four hour specimen of urine on May 16 had a specific gravity of 1.016 and contained no albumin or casts.

I mention the blood urea nitrogen, the albumin and casts because after the con-

stant use of insulin on my patients since the early part of 1923, I have never found one that I thought had any kidney injury due to the use of insulin. This patient, having had this tremendously large amount in the short period of time should certainly be a test case.

In the American Journal of Medical Sciences for May, 1930, Dr. Leona Meyer Bayer has reported six fatal cases of diabetic acidosis, Case VI of which received 1145 units of insulin during a six and one-half day period. She suggests the possibility of a relationship between a nephrosis, which was found in her patient at autopsy, and "the huge amount of insulin received."

She also states that some degree of nephropathy accompanies almost every severe diabetic acidosis. Albumin and casts were found in all of her cases.

In this case, as well as in nearly all of my more severe diabetic coma cases, albumin and casts were both found on entrance but were constantly absent after the first thirty-six hours.

I am reasonably sure that the large amount of insulin was not responsible for the nephrosis in Dr. Bayer's case. The largest amount of insulin received by her patient in any twenty-four period was 290 units. On the day following the second largest amount, 275 units, the blood sugar was 460 mg. She does not give the $CO_2$ determination, hence we can not be sure that her patient was in acidosis. The blood urea nitrogen arose from 28.9 mg. on entrance to 72 mg. on date of expiration.

I have given 400 units of insulin in a twenty-four hour period to one other coma patient whose $CO_2$ was 4.5 volume per cent on entrance. The same patient came in two years later with a $CO_2$ of 9 volume per cent to receive 460 units in twenty-four hours. The urine contained a large amount of albumin and casts on both occasions but within thirty-six hours each time the urine was normal.

In nephrosis one of the outstanding findings is the albumin, so while I do not have the necropsy findings to prove that my patient did not have nephrosis, yet I feel certain that had there been much degeneration of the tubules, albumin would have been found in at least small amounts.

I mention this only as an argument in favor of the use of large amounts of insulin when the $CO_2$ seems fixed and will not respond to smaller doses.

It is my opinion that 20 to 40 units should be the maximum of a single dose of insulin but should be repeated every thirty, sixty, or ninety minutes, depending on the severity of the case, namely, the amount of sugar in the urine, the height of the blood sugar, and the carbon dioxide combining power of the blood plasma.

It is possible that Dr. Bayer did not intend to leave the impression that large doses of insulin might always cause nephrosis. However, since that was my interpretation of it I feel justified in offering this case which received much more insulin in a given period than her patient did and still had no apparent damage to the tubules of the kidney.

## SUMMARY

1. A case of diabetic coma is presented in which the $CO_2$ remained at 5 volume per cent or below for a period of sixteen hours.

2. During the same sixteen hours 660 units of insulin were given subcutaneously in 20 unit doses at thirty minutes intervals.

3. During this interval she received 1700 cc. of 3 per cent glucose, subpectorally, 100 grams of glucose and 46 grains of sodium bicarbonate in 1040 cc. of water, intravenously and 500 cc. of 5 per cent glucose by proctoclysis.

4. After only 190 units of insulin, intravenously, to which 115 grains of sodium bicarbonate were added, the $CO_2$ was raised from 4 volume per cent to 16.4 volume per cent in ten and one-half hours.

5. A few small doses of adrenalin were given during the time she was taking the intravenous insulin.

6. Argument is offered with clinical observation as proof against the possibility of insulin alone causing nephrosis in the diabetic, even though extremely large doses have been used.

## CONCLUSIONS

1. This case should teach us that no

set rule can be followed in treating diabetic coma. Each case must be handled on its own merits.

2. Every severe case must be watched constantly, day and night, by the physician himself if the life is to be saved.

3. The value of insulin given intravenously in this particular instance seems to be proven.

4. The use of the frequent doses of sodium bicarbonate, intravenously, and the small doses of adrenalin, subcutaneously, are interesting facts although they may have had little to do with the improvement noted.

5. It is the opinion of the author that huge doses of insulin alone do not cause nephrosis in the diabetic who needs the amount given.

———R———

## TUBERCULOSIS ABSTRACTS

That children may have a latent form of tuberculosis is a novel and disturbing thought to most parents and teachers. The growing appreciation of the significance of childhood type of tuberculosis is creating a demand that something be done to prevent the latent form of the disease from progressing. Some are urging the development of preventoria. But there is considerable confusion in the public mind, as well as among the profession, as to what a preventorium is and what purpose it is supposed to serve. The following is a resume of a recent article attempting to clarify the subject.

### WHAT IS A PREVENTORIUM?

The term "preventorium" was first used to designate a convalescent home for adults (Brehmer's Rest at Ste. Agathe des Monts in Canada) on the ground that any depleting illness may predispose to tuberculosis and that aftercare tended to prevent tuberculosis.

In 1909, New York City, through the interest of Dr. Alfred Hess, established at Farmingdale, N. J., an institution to take care of "pre-tuberculous" children. It was called a preventorium. Unlike the Canadian institution, which was designed for convalescent adults, that at Farmingdale was exclusively for children presumably threatened with tuberculosis. Similar institutions sprang up, though practices and procedures were not uniform.

Ideas as to what the preventorium was supposed to be and do were vague. However, the dominating purpose of all was a desire to provide care for the sick child. The term, "pre-tuberculous," was applied rather loosely to the child with actual tuberculosis, the child of a tuberculous household, and the child below par in health, as expressed usually in malnutrition, but all were regarded as sick children.

Quite another development in these early days was the establishment of fresh air schools and open window rooms. Their purpose was to increase the resistance of certain selected persons, who were not sick but who were

Open Air Classes, Sunshine Hills, Springfield Lake (Ohio) Sanatorium

presumed to be potential victims of tuberculosis. The emphasis was on health building rather than on disease prevention.

As we learned to differentiate between infection, mass infection, and actual disease, and as it became evident that the beneficial results of both preventoria and fresh air schools were to be attributed to rest, good nutrition, and a well-regulated regimen, the procedures and objectives of both types of institutions tended to merge. For that reason, it is today impossible to answer statistically how many preventoria and fresh air schools there are in the United States.

Three years ago, the Committee on Preventoria of the National Tuberculosis Association formulated this definition: "A preventorium is a twenty-four hour, twelve months institution for the care and observation of children substandard in health." The general purpose of this institution was assumed to be giving preventive care to children threatened with tuberculosis, heart disease, or other potential disability. Exact standards of eligibility were not defined but the Committee indicated the groups from which selections for the preventorium might be made, as follows:

1. Children exposed to tuberculosis at home, or in whose immediate family there has been a recent death from tuberculosis.
2. Children who have had tuberculosis, whose lesions are not active, and who appear to be in need of further care and observation.
3. Children suffering from malnutrition.
4. Chlidren who tire easily and who are unable to carry on their class work.
5. Children frequently absent because of colds, bronchitis, etc.
6. Children suffering from rheumatic heart disease (of certain classifications).

It is now recognized that many children who need protective care do not require the exacting regimen furnished by a twenty-four hour, highly specialized preventorium. Some preventoria assume complete charge of their children, keeping them for twenty-four hours of the day the year round until they have apparently developed good resistance, while others permit their charges to return home over the week end. The predominating purpose of these institutions is to give medical care, and secondly to provide school instruction. Another type of preventorium is essentially a school which cares for the children only during school hours and which furnishes supplementary meals, rest periods during the day, etc., while in the meantime conditions in the children's homes are scrutinized and supervised by a special follow-up worker.

While preventoria, fresh air schools, open window classrooms, nutrition classes, and health camps vary widely in their procedures, the main purpose of all seems to be to give handicapped children an extra lift so as to prevent the threatened disaster of pulmonary tuberculosis in later years. Opinion in the main seems to be that children with the childhood type of tuberculosis (unless progressive) should not be regarded as sick children but rather as being threatened with disease. Certainly, children with the adult type of pulmonary tuberculosis should not be in the preventorium, not only because they are definitely ill, but also because they are potential spreaders of the disease.

There would be less confusion of thought about preventoria were discussions concerned not so much with building construction, physical equipment, staff, etc., but with the therapeutic requirements of children who need protective care. Indications for treatment of such children are:

1. Contact with the tuberculous adult, who presumably has infected the child, must be broken. This is done by removing the tuberculous adult to a sanatorium, by taking the child out of the home, or by teaching every member of the household the principles underlying the transmission of tuberculosis.
2. The child must be relieved of all possible strain; i.e., strenuous exercise and burdensome school work. Rest is the cornerstone on which preventorium care is based.
3. The child's health must be built up; physical defects must be corrected and

the benefits of good food, sunshine, and fresh air must be made available.

4. The psychology of the child must be adjusted so that he will not think of himself as being inferior to others gifted with greater reserve of physique, and yet restrain over-ambitious impulses.

These indications for treatment can, under ordinary circumstances, be met without the aid of a definite institution, but there are, of course, numerous "problem families," as the social worker calls them, where it is impossible to meet the requirements enumerated above. These problem families are not limited to the poor or ignorant, but include many families of intelligence and of means who, for any reason, are unable to afford the child the necessary protection.

While no formula can be given for the solution of the problem, an understanding of the general principles should enable any community to determine the type of preventorium care which best suits its needs. The various attempts now being made to cope with the problem should be regarded as experiments. The test of time will reveal which type of preventorium is the most efficient. Fortunately, a number of preventorium institutions are carefully following their pupils into adult life in order to learn what their subsequent experiences may be. When enough of such data has been collected, we may be able to determine more precisely what the ideal form of organized care may be.—*What is a Preventorium? H. E. Kleinschmidt, Jour. of Pub. Health, July,* 1930.

———B———

**Use of Modified Drinker Respirator in Treatment of Asphyxia Neonatorum**

Five severely asphyxiated new-born infants have been treated successfully by Douglas P. Murphy, Philadelphia, and J. A. Coyne, Boston (J.A.M.A., Aug. 2, 1930), in the mechanical respirator. In every case, other methods of resuscitation had been tried without success. Each infant finally breathed normally after a more or less prolonged period of mechanically induced artificial respiration, although none of these infants were breathing when placed in the respirator. The time that elapsed between the inception of artificial respiration given by means of the mechanical respirator and the first independent breath taken by the infant was noted in four cases. In three of these, the first spontaneous inspiratory effort was not observed until more than five minutes had passed, whereas in the fourth case it did not take place until one hour and four minutes had elapsed. Since the initiation of respiration was not coincidental with the first artificially produced chest excursions, it would seem that the mechanical respirator does not initiate but probably stimulates respiration. Of these five infants, two survived and were discharged at the end of fourteen days. The three remaining infants died. It is believed that none of these five infants would have survived asphyxia had they not been treated in the mechanical respirator.

———B———

**The Hosts of Tularemia**

Tularemia is principally a disease of wild life. In conserving wild life are we in danger of enlarging the reservoir of infection from which human cases are derived? The suggestion was made recently by Dr. R. G. Green of the University of Minnesota. He points out that with a single exception all recorded human cases appear to have been derived from infected animals or intermediate insect hosts. Infection is not passed ordinarily from man to man even when special precautions are not taken to avoid it. Dr. Green suggests that the frequency of human infection is probably a cyclic phenomenon depending on exacerbations of the disease in the animal reservoir. Until some means of combating the disease at this point is discovered, as for example the destruction of the deer fly and the ticks that act as intermediate hosts, the conservation of wild life is liable to extend the incidence of the disease in man.—J.A.M.A., Aug. 30, 1930.

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**"Do you think your father will object to my suit?"**

**"I don't see why he should; he wears one almost as bad."**

# THE JOURNAL
of the
# Kansas Medical Society

**W. E. McVEY, M. D. - - - Editor**

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## POLITICAL WISDOM

If the men who worked so long and so hard to get the medical practice act through the legislature in 1901 had realized that in passing it the legislators believed they were granting a concession of some kind to the medical profession of the State, they would no doubt have changed some of the provisions it contains. They would have provided for an examination fee of twenty-five dollars and an annual registration fee of five dollars, and they would have had a board of three members instead of seven and would have provided that each member of the board should receive ten dollars per diem and expenses while engaged in the duties required and authorized by the board. The fees would amount to about twelve thousand dollars which divided by three would give each member of the board a nice little addition to his professional income. But no one seemed to know about that. They all seemed to believe the State was setting up a standard of education for all who desired to practice the healing art, and they tried to make it cost the poor fellows who were just out of school as little as possible. Under this political misconception the board has gone on for nearly thirty years examining applicants, every now and then increasing the requirements and broadening the scope of the examination, and paying their actual expenses out of their own pockets when the fees collected were inadequate.

There are wise men who never acquire political wisdom no matter how long or how hard they try. There must be a lot of them in our profession. Those who planned the duties and emoluments of some of the more recently created boards showed more political sense though they were far behind the medical profession in education and ordinary intelligence.

In the last number of the Journal some suggestions were made for an economic reconstruction of the laws which now provide for a number of needless and expensive boards, boards whose duties or functions, to more or less extent, duplicate or conflict with the functions of the Board of Health. The duties of all of these boards could be performed more economically and more efficiently under the direction of the Board of Health, in fact the fees now collected by these boards would enable the Board of Health to carry on the whole job without any appropriation from other State funds.

It has never been regarded as good political policy to destroy any geese that are laying nice golden eggs in the laps of party friends and adherents, and no doubt it would be readily explained to those who proposed to abolish these boards that they do not add to the tax burden of the people, since the laws provide that their expenses must be paid out of the funds they themselves create. In fact they are good and healthy geese that don't have to be fed by the tax payers.

Apparently that is true but in fact

these boards are appointed to act as agents or representatives of the Sate in the exercise of some of its police powers. The fees collected are the property of the State, are a part of the State's income for the judicious expenditure of which its officers are held accountable to the people. If the laws permit these funds to be dissipated by unnecessary and extravagant expenditures it would be good statesmanship if not good politics to require their revision.

It might under present conditions prove the heighth of political wisdom to make a real effort to economize in the State's expenditures. The boards here referred to are those only whose functions are more or less directly related to public health, but no doubt those who are familiar with other departments of the State's affairs could point out other needless and expensive boards and commissions whose duties could be more satisfactorily performed by one of the State departments at considerable less cost.

The present agitation for an income tax is not likely to find favor with the medical profession. Those who are fortunate enough to have to pay a federal income tax are not likely to care for any more of that sort of business and those who are exempt will prefer to wait until their incomes require them to make returns on the federal tax. At any rate it would be better politics and better business to eliminate unnecessary expenditures before seeking additional sources of possible revenue.

### THE FUTURE IN MEDICINE

There are many prophets in the medical profession, at least there are many who in their mind's eyes see the future of the practice of medicine, and are willing to tell us what they see. We who read their prophecies are likely to be confused between the promises of a rehabilitation of the general practitioner and a reestablishment of his former prestige on the one hand, and the predictions of further invasions by State, industrial and insurance medicine on the other.

Some men seem to make their prophecies on the theory that what ought to be will be, an optimistic but hazardous viewpoint in the consideration of the future of the practice of medicine. In fact too much that is of vital interest to the medical profession has been treated with good intentions and dismissed with the adoption of resolutions.

There are times when optimism may be regarded as a commendable virtue, but there are times when too much optimism may be interpreted as criminal negligence.

From its very beginning specialized practice has grown and spread without restriction. It has long since outgrown the field it was originally intended to occupy, for in the beginning ethical specialists, at least, confined their services to cases referred by general practitioners. It was the decadence of this ethical principle which has been responsible for the lost prestige of the general practitioner.

When half or two-thirds of the specialists take up general practice that principle may be restored, but under the existing proportions there are not enough general practitioners to refer enough cases to keep one-third of the specialists occupied.

The present day specialist is no longer dependent upon the general practitioner, most of his cases come directly to him. In fact there are about as many cases referred by specialists to general practitioners as are referred by general practitioners to specialists. Search as he may one will fail to find anything in this situation to justify a hope of the reestablishment of the former prestige of the

general practitioner, or if you please the family physician. It was his optimism, his confidence in the stability of his position and his neglect to maintain his original ethical relationship wth the specialist, that led to his dethronement.

No one needs a prophet to point out to him what is happening to the practice of medicine, nor to tell him that the trend of what is happening now is toward such conditions as exist in Germany and England. There is no use to say that such conditions are not possible in this country, for while we are so consoling ourselves we are being docilely driven into the run-ways from which there is but one exit, complacent submission to the inevitable. Every evidence points to some form of state medicine or sickness insurance as the ultimate termination of the present tendencies. How otherwise can one interpret the strong sentiment manifested in support of the proposal to extend the governmen medical service to all who served in any capacity in the Great War, whether the disability or ailment was contracted in or on account of such service or not?

It would be just a little step from that to government medical service for all the people, and equally justifiable on the same grounds for practically every adult citizen contributed in some way to the support of the country and the maintenance of the army during that conflict.

The medical profession was apparently indifferent to the possible effects such action might have upon its future, at any rate it offered no general or concerted opposition.

It has been but a comparatively short time since railroad surgeons were employed by railroad companies to care for those injured in the line of duty, so as to minimize the damage claims to which they were liable. The subsequent evolution of such a medical department into a hospital association supported by assessments upon the employees, and by which not only the injuries sustained in line of duty but all their illnesses are cared for, seemed no occasion for uneasiness on the part of the medical profession. The establishment of various forms of sickness insurance by other large industries and the fact that many of the smaller industries have found agencies prepared to render similar service to their employed, was apparently recognized by the medical profession as an economic necessity. Lay organizations with philanthropic ambitions have readily received the support and cooperation of the medical profession in a great variety of special fields of medical practice. Even insurance associations have established sickness insurance departments with the cooperation and the official approval of the medical profession.

At the last annual meeting of the American Medical Association Dr. M. L. Harris, in his address, again recommended that component county societies should incorporate and establish medical centers owned, controlled and managed by the members of these societies, where all classes of persons who are unable to pay regular fees can be given the highest type of medical treatment at prices within their means. In this suggestion lies the only solution of the problem ever offered, but it seems to have made no impression upon these organizations.

There is still perhaps in the minds of the members of these organizations some memory of those fine ethical discriminations by which it was regarded as ethical for a doctor to engage his services to a railroad company, a coal mining company, or other industry, at a stated salary, whether or not that salary was paid out of the sum accruing to the company or industry from monthly assess-

ments upon its employees; but regarded as unethical for a doctor to engage his services direct to the employees for the amount such monthly assessments would make. In other words it is ethical for a member of our Society to accept employment, at a salary of $200 or $300 a month, with a corporation or a company employing a thousand men, to render whatever medical service those employees may require, the corporation or company collecting from its employees one or more dollars each per month for such service; but it is unethical for a member of our Society to make a contract directly with those one thousand employees to render whatever medical services they require in consideration of the payment of one dollar each per month.

### BRINKLEY'S FINISH

On Monday, September 15, members of the Board of Medical Registration and Examination and others visited the Brinkley Hospital at Milford where they had been invited by Dr. Brinkley to witness a number of his operations. One can hardly imagine that he was sincere in extending this invitation but if he was he certainly underestimated the intelligence of the men invited. He had given, in the literature sent out to prospective patients, detailed descriptions of his operations, descriptions that would make a strong appeal to the suffering prostatic. The fact that such operations were impossible was a matter of no concern so long as his audience was composed of laymen. But little tricks with anatomical structures that are not there just can't be done under the critical eyes of such surgeons as Edgerton, Orr and Nesselrode.

The hearing was resumed on the sixteenth and those mentioned above testified that the glands were removed from the goat by Mrs. Brinkley and the aseptic precautions were inadequate to prevent infection of the wound into which they were implanted. They were unanimous in saying that the operations performed were not the operations described in the literature sent out from the Brinkley Hospital. They were also unanimous in their conclusions that these operations could not possibly reduce an enlarged prostate and that they could not have any rejuvenating effect.

Numerous affidavits were introduced by both parties to the hearing and the Board went into executive session Tuesday evening to review the evidence and to reach its decision.

On the 17th the Board issues an order revoking Dr. Brinkley's license, the text of the order is as follows:

Before the board of medical registration and examination of the state of Kansas.

In the matter of the revocation of the certificate of Dr. John Richard Brinkley to practice medicine and surgery in the state of Kansas.

Dr. L. F. Barney, complainant, vs. Dr. John Richard Brinkley, respondent.

Order and judgment revoking certificate of Dr. John Richard Brinkley to practice medicine and surgery in the state of Kansas.

Now on this 17th day of September, 1930, at an adjourned meeting of the board of medical registration and examination of the state of Kansas, held in the Hotel Kansan in the city of Topeka, Shawnee County, Kansas, the above entitled proceeding came on for decision by said board; said proceeding having been instituted upon the written complaint of Dr. L. F. Barney, complainant, of Kansas City, Kansas, filed with the secretary of said board on April 28, 1930, charging Dr. John Richard Brinkley, respondent, of Milford, Kan., with being guilty of gross immorality and unprofessional conduct and requesting the revocation of the certificate of said Dr. John Richard Brinkley authorizing the

latter to practice medicine and surgery in the state of Kansas; evidence on behalf of complainant having been submitted to said board on July 15, 16, 17, 18 and 22, 1930, and evidence on behalf of respondent having been submitted to said board on July 18, 23, 24, 25, 28, 29, 30 and September 16, 1930, and evidence in rebuttal on behalf of complainant having been submitted to said board on the 16th day of September, 1930; complainant having appeared in person and by his attorneys, William A. Smith, attorney general; W. C. Ralston, assistant attorney general, and Donald A. Campbell, of Topeka, Kan., and respondent having appeared in person and by his attorneys, F. S. Jackson, James E. Smith and Schuyler W. Jackson, of Topeka, Kan.; and said proceeding having been taken under advisement by said board on the 16th day of September, 1930.

The following members of the board of medical registration and examination of the state of Kansas, constituting the entire membership of said board, were present during all the time of such hearing and are now present: Dr. J. E. Hassig, president; Dr. A. S. Ross, secretary; Dr. H. Z. Hissem, Dr. G. R. Dean, Dr. C. H. Ewing, Dr. M. C. Jenkins and Dr. O. S. Rich.

Thereupon, said board, being fully advised in the premises, finds:

1. That on the 15th day of June, 1916, respondent, Dr. John Richard Brinkley, was granted certificate No. 5845 by the board of medical registration and examination of the state of Kansas, permitting and authorizing him to practice medicine and surgery in said state.

2. That respondent, Dr. John Richard Brinkley, has been, and is, guilty of gross immorality as charged in said complaint.

3. That respondent, Dr. John Richard Brinkley, has been, and is, guilty of unprofessional conduct as charged in said complaint.

4. That the certificate of respondent, Dr. John Richard Brinkley, authorizing him to practice medicine and surgery in the state of Kansas, should be revoked.

It is therefore considered, ordered and adjudged by the board of medical registration and examination of the state of Kansas, that the certificate heretofore issued to respondent, Dr. John Richard Brinkley, authorizing him to practice medicine and surgery in the state of Kansas, be, and the same is hereby revoked.

(Signed) J. F. Hassig.
President Board of Medical Registration and Examination of the state of Kansas.

A. S. Ross, secretary board of medical registration and examination of the state of Kansas.

C. H. Ewing, G. R. Dean, O. S. Rich, M. C. Jenkins, H. Z. Hissem, board of medical registration and examination of the state of Kansas.

Attorney General Smith was reported to have declared that the Brinkley-Jones Hospital at Milford would be prevented from operating. Apparently this was no idle threat for he has applied for an injunction to close the hospital.

He also supplied the county attorney of Geary County with information against the man Osborn who has been practicing at the Brinkley-Jones Hospital for a number of years without having a license from the Board of Registration and Examination. The evidence was obtained from witnesses who testified in the Brinkley hearing and there were about fifty counts against him.

It is understood, however, that Osborn is no longer in the state and there is some question if requisition can be secured.

The Attorney General must be commended for his ultimate interest in the Brinkley affair and the expedition with which the hearing was conducted after he took an active part in it, as well as for his activity in seeing that violators of the medical practice act are prosecuted.

———R———

**Little Girl (to her playmate)—"When I was born I was so s'prised I couldn't speak for a whole year and a half!"—Tit-Bits, London.**

## CHIPS

Peshkin and Fineman report their results in the treatment of asthma in children with a ketogenic diet, *American Journal of Diseases of Children,* June. Fifteen children ranging in age from 3 to 15 years with asthma, who had proven resistent to all other methods of treatment were placed upon a high caloric diet with a ketogenic ratio of 3.1. At the end of the third week fourteen of the children showed moderate or marked improvement or relief from asthma. This improvement was maintained for two months longer. After that and up to the tenth month 53 per cent of the patients were considered moderately to markedly improved or relieved from asthma. In hay-fever and in asthma due to pollen not much can be expected from the ketogenic diet although in the latter it may be used in connection with the pollen treatment with some advantage. The theory of the effect of the ketogenic diet in these cases is that it produces a physicochemical change in the cells and blood of the patient thereby inducing a partially or completely restored "allergic-balance."

The clinical histories of sixteen cases of malignant hypertension with the post mortem findings in twelve of them are reported by Murphy and Grill in the *Archives of Internal Medicine,* July. The chief clinical observations were headache, loss of weight, persistent excessive hypertension, functional failure of one or more essential organs, a progressively downward course and a rapid termination. The essential lesions were arteriosclerotic, with involvement of the smallest arteries and arterioles. In six cases necrotic lesions had developed in the walls of the afferent glomerular arterioles and in the loops of the corresponding glomeruli. Hypertrophy of the media of the arterioles of the skeletal muscles was usually found. In their opinion the morphologic difference between malignant hypertension and the benign form is only one of degree.

There are so many different opinions about blood pressure that the report of Alvarez and Stanley, *Archives of Internal Medicine* for July, ought to be of considerable interest. They made a careful analysis of blood pressure measurements on 5,364 white prisoners and reached some very interesting conclusions: The level of pressure does not rise in most persons with old age. Many of those found to have hypertension during the fifth decade of life probably already had it at the end of the second. The level of blood pressure seems to be little affected by dissipation, the use of alcohol or drugs, or even by syphilis. It is affected largely by heredity. It is also affected by excitement, nervous strain, the days work, the amount of fat in the body and by the temperature of the air. It is a little increased by cool weather. The use of tobacco by young men appears to increase the pressure a very little but does not cause pathologic hypertension. The mean pressure in 5,364 white prisoners of all ages from 15 to 84 was 118.5 while in 857 between the ages of 40 and 84 the mean was 123.7.

In a paper by Saltzstein and Sandweiss, published in the July number of the *Archives of Surgery,* is this very significant statement: "In the arguments concerning the frequency with which chronic gastric ulcer develops into gastric carcinoma, the fact may be lost sight of that it is not the frequency with which this takes place, but the difficulty of distinguishing clinically gastric ulcer from early carcinoma which is important." From the histories of 287 fatal cases of cancer of the stomach, 24.7 per cent were preceded by long continued indigestion and 75.3 per cent started suddenly from previous good health. One-third of those having a history of prolonged indigestion had been diagnosed as gastric ulcer while ten per cent of those starting suddenly from good health had a history typical of ulcer.

Deaths from uremia following prostatectomy may be predicted or avoided by a preoperative estimate of the elimination of urea and its retention. Tests for the urea content of the blood are only required in advanced cases. In the June 7 number of the *Lancet* Sir J. Thomas-

Walker made a report of his analysis of 274 prostatectomies. In 194 of these the urea concentration was 2.0 per cent and over and there were no deaths. In 21 cases it was 1.8 per cent to 2 per cent and there was one death. In 34 cases it was 1.5 per cent to 1.8 per cent and there were three deaths. In 25 cases it was 1.0 per cent to 1.5 per cent or under and there were three deaths. His conclusion is that there is no risk of uremia following prostatectomy in cases where the urea concentration figure is 2.0 or over, but under this the danger increases.

The diagnosis of hypertension is easy, but the treatment is uncertain and patients usually want some opinion as to their future. Stieglitz, in the August number of *Archives of Internal Medicine*, suggests a test by which a fairly positive prognosis may be reached. After determining the arterial tension, a pearl containing 5 minims of amyl nitrite is broken and the patient requested to inhale deeply three or four times with the liquid held directly under the nose. The patient becomes flushed, perspires freely and complains of vertigo or faintness. At this time the tension is at its lowest and is again determined and checked several times. The patient is then relieved by administering some aromatic spirits of ammonia. The degree with which the diastolic pressure approaches the normal under the influence of amyl nitrite is the prognostic criterion. In cases of hypertension of the purely spastic type the diastolic pressure may fall below normal while in extensive fibrosis of the arterioles the fall may be relatively slight. The former are subject to therapeutic control while the latter are rarely benefited.

Aycock and others report the results of treatment of preparalytic poliomyelitis with convalescent serum, *Journal Infectious Diseases*. By comparing the fatality rate, the percentage without paralysis, the average amount of paralysis, in these cases with untreated cases in the same outbreak, they were able to determine some clinical evidences of the favorable results to be expected from this treatment.

## SOCIETIES

### CLAY COUNTY MEDICAL SOCIETY

The regular meeting of the Clay County Medical Society was held in the sun parlor of the Clay Center Municipal Hospital on the evening of the 17th.

The meeting was called to order by the president; Dr. E. N. Martin was acting secretary. A large number of members and four visitors were present. The visitors were Dr. Earle Brown of Topeka, Kan.; Dr. McCord of Topeka, Kan.; Dr. Lester of Clay Center, Kan., and Dr. Creviston of Oldsburg, Kan.

Following a short business session, Dr. Earle Brown gave a very interesting and instructive talk on "Public Health—Past, Present and Future." A long discussion of acute anterior poliomyelitis followed his talk.

Drs. Brown and McCord were elected to honorary membership in the society.

On motion the meeting adjourned at 10:30 p. m.

F. R. Croson, M.D., Secy.

### RUSH-NESS COUNTY MEDICAL SOCIETY

The Rush-Ness County Medical Society met September 10 with Dr. J. A. Blount at Burdett, Kansas. There were eleven doctors present. Dr. A. E. Reed of Larned, Kansas, was guest of the evening.

Dr. T. F. Brennan of Ness City was voted into membership in our Society, which is growing both in size and in quality of its programs. Two very unusual as well as interesting cases were presented by Dr. Blount and Dr. Reed showed us a rare surgical specimen of an abdominal pregnancy.

Dr. J. A. Blount gave a paper on "Some Factors in the Consideration of Diarrheas of Infancy" and a round table discussion followed.

Dr. Reed next showed us the specimen of abdominal pregnancy and gave us the history, operative findings and a general discussion of the condition which we find to be quite rare in medical literature.

Following the meeting a delicious luncheon was provided by Dr. Blount and served by members of the medical auxiliary.

The Society will be the guests of Dr. Attwood at LaCrosse for the November meeting.

F. D. SMITH, M.D., Secy.

## DEATHS

G. E. Webber, Morland, aged 58, was instantly killed August 11, 1930, in an automobile accident. He graduated from Medico-Chirurgical College, Kansas City, Missouri, in 1904. He was a member of the society.

## BOOKS

**Medical Dictionary by Thomas Lathrop Steadman, M.D., Editor of the "Twentieth Century Practice of Medicine," etc. Eleventh revised edition. Published by William Wood and Company, New York. Price $7.50.**

Certainly there is nothing requiring such frequent revision as a dictionary. During the two years since the last edition of this one not only many new words have been introduced but there have been many changes in spelling and in the usage of words. The editor of this dictionary must be complimented on the thoroughness of this revision and on his persistent demands for certain reforms in spelling, however, one observes that he, too, has yielded to the compulsion of usage and has authorized the use of "acute abdomen," and other terms of that class.

**Anatomy and Physiology, a text book for training schools and other educational institutions by Elizabeth R. Bundy, M.D., sixth edition revised and enlarged by S. Dana Weeder, M.D., Instructor in Anatomy, University of Pennsylvania, etc. Published by P. Blakiston's Son & Company, Philadelphia.**

This is a very well arranged textbook giving a fairly serviceable description of the anatomy and physiology of the human. Sufficiently elaborate for the purpose for which it is intended, at any rate. The descriptions are accurate and the illustrations are adequate.

**Nervous Indigestion by Walter C. Alvarez, M.D., Associate Professor of Medicine, University of Minnesota. Published by Paul B. Hoeber, Inc., New York. Price $3.75.**

This is a subject which too few of us know much about. This book will be of the utmost value to those who have the time and patience to study numerous chronic invalids or semi-invalids in whom no lesions can be discovered. The author has made a study of this subject and describes the methods in which emotions can effect the digestive tract. His method of treatment as described has been evolved by experience and investigation.

**Diseases of the Skin. A Text-book for Practitioners and Students. By George Clinton Andrews, A.B., M.D., Associate Professor of Dermatology, College of Physicians and Surgeons, Columbia University; Consulting Dermatologist and Syphilologist to Tarrytown Hospital; to St. John's Hospital, Yonkers; to Grassland's Hospital, and to the Broad Street Hospital, New York City. 1091 pages with 988 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $12.00 net.**

The author has given us a very elaborate and comprehensive work on dermatology. His effort to make it of the most practical value is evident. One of the necessary features of a textbook on this subject is numerous and good illustrations. Practically all of his illustrations are made from photographs so that what the text fails to make plain the illustrations do. The arrangement is to be commended. His classification is an eminently practical one. A considerable amount of space is given to roentgen ray therapy. The work as a whole deserves the highest praise.

**The Surgical Clinics of North America. (Issued serially, one number every other month.) Volume 10. No. 4. (Southern Number—August 1930) 263 pages with 96 illustrations. Per clinic year. February 1930 to December 1930.) Paper, $12.00; Cloth, $16.00. Philadelphia and London. W. B. Saunders Co.**

The first clinic reported is that of Dr. W. D. Haggard in which several operations are described. Miller shows some very interesting gynecologic cases. Brooks presents a case of aneurysm of the axillary artery. Royster shows an endo-aneurysmorrhaphy in a case of aneurysm of the brachial artery, and also shows a large aneurysm of the sciatic artery. Maes also presents a number of interesting surgical cases. Stewart McGuire discusses the treatment of duodenal ulcers. Peple presents a case of arteriovenous fistula. Campbell discusses fusion of tuberculous joints. Alton Ochsner discusses the use of iodized oil in the treatment of bronchiectasis. Mason's clinic includes hernia, intussusception

and gall stones. Abell's clinic includes cases of cardiospasm, cardiospasm with esophageal sacculation and diverticulum. Guerry's clinic includes reconstruction of the bile passages. Shock from removal of gauze drain following cholecystectomy. Hendon's clinic deals with the open treatment of fractures.

### Inactive Duty Training School Rochester, Minnesota, Nov. 9-23, 1930

The second annual inactive duty training period for medical reserve officers will be held at Rochester, Minnesota, November 9-23 under the sponsorship of the Mayo Foundation; directed and personally supervised by instructors of the Medical Corps of the United States Army detailed to Rochester for the purpose. The curriculum embraces basic subjects essential to all medical officers.

The school offers opportunity for officers who have not received summer training to earn one hundred hours toward the required number for promotion at the expiration of their respective periods of appointment. The instruction covers a period of fourteen days of seven hours each. All medical reserve officers are eligible.

Any physician wishing to join the reserve corps should apply at once for a commission and when commissioned will be qualified to register for the course.

The course of instruction is arranged so as to allow visiting officers to attend clinics in the mornings and school of instruction during the afternoons and evenings.

Last year's course proved very profitable. Several officers of various branches of the regular army visited the school.

Medical reserve officers interested should write Colonel Louis B. Wilson, The Mayo Foundation, Rochester, Minnesota.

### Evaluation of Therapeutic Results in Essential Hypertension

In a series of forty unselected hypertensive patients, seriously and enthusiastically treated by David Ayman, Boston (J.A.M.A., July 26, 1930), by the daily administration of a few drops of dilute hydrochloric acid, the symptoms were definitely improved in thirty-three or 82 per cent. Ayman finds that the symptoms associated with uncomplicated essential hypertension may frequently be relieved by the suggestion inherent in any seriously and enthusiastically prescribed drug or method of therapy. This is the probable explanation of many successes reported in the past.

## MEDICAL SCHOOL NOTES

Dr. J. Lloyd Collins, '28, recently visited at the Bell Memorial Hospital. Dr. Collins has accepted a second year Fellowship at the Cleveland Clinic in Cleveland, Ohio.

Dr. John A. Billingsley, '28, is taking Post-Graduate work in Ophthalmology at the Knapp Memorial Hospital, New York City, under Dr. Arnold Knapp.

Dr. Jesse Potekin, who recently interned at the Bell Memorial Hospital, is now associated with Dr. Ben Morris, '25, at Quinter, Kansas.

Dr. David Pankratz, formerly of the Anatomy Department of the University of Kansas School of Medicine, is now head of the Anatomy Department of the University of Tennessee School of Medicine, Memphis, Tennessee.

Dr. John Nanninga of Rush Medical School has recently accepted a position in the Department of Internal Medicine. Dr. Nanninga is doing research work.

Dr. and Mrs. F. C. Helwig recently returned from a trip abroad.

The following men are serving internships at the Bell Memorial Hospital this year: Doctors Paul Cameron, Harold Fairchild, Frank S. Hogue, Marwin Rumold, Richard R. Sheldon and Wilfred Curphy, all of the University of Kansas Medical School. Dr. L. Bernard McBain of the University of Wisconsin School of Medicine and Dr. E. Lee Shiflett of the University of Virginia are also interning at this hospital. Dr. Joseph Graham of the University of Virginia Medical School is the Resident in Surgery, and Dr. Kenneth Hoel of Wisconsin University Medical School is the Resident in Medicine.

Dr. Raymond Gard, '27, who is located at the Halsted Hospital, working with Dr. A. E. Hertzler, recently visited at the Bell Memorial Hospital.

The members of the Senior Class at the University of Kansas School of Medicine assisted Dr. Ralph I. Canuteson, who is the Head of the Student Health Service at Lawrence, in giving physical examinations of the Freshmen at the University this fall.

Dr. R. M. Isenberger did some work with Dr. A. E. Hertzler at the Halstead Hospital, Halstead, Kansas, this summer.

The following men have been added to the Dispensary Staff in various departments: Dr. A. M. Ziegler, Department of Surgery; Dr. Irwin Brown, Department of Urology; Dr. J. Eugene Lacy, Department of Nose and Throat; Dr. T. H. Aschman, Department of Obstetrics, and Dr. Carl N. Lindquist, Department of Medicine.

Dr. J. W. Duncan, Associate Professor of Surgery at the Creighton University, Omaha, Nebraska, recently visited at the Medical School.

Dr. A. W. Sellards, Associate Professor of Tropical Diseases, Harvard Universiay, was the guest of Dr. Ralph H. Major at the Medical School.

There were twenty-three nurses entered this fall in the Nurses' Training School at the Bell Memorial Hospital.

In 1918, Dr. J. L. Porter of Paola, Kansas, bequeathed to the School of Medicine of the University of Kansas, a sum of money for the stimulation of scholarship and research in the Medical School. A portion of the income from this fund has been used to provide a scholarship for a worthy student. The remainder of the income is to be used to defray the expenses of an annual lecturer in medicine. Dr. Joseph Collins of New York City conducted the lectures this year at the Bell Memorial Hospital, which were held October 13 and 14.

———R———

Teacher (to new boy): "What's your name?" New Boy: "'Erbert 'Arris." "Always say 'sir' when you are speaking to a master, it's more polite." New Boy (apologetically): "Sir 'Erbert 'Arris."

**Medical Service in Federal Prisons**

On May 13, 1930, the President approved an Act of Congress which authorized the United States Public Health Service to provide medical service in Federal penal and correctional institutions under the Department of Justice. Henceforth the medical and psychiatric work in Federal prisons will be supervised and furnished by personnel of that service. This new legislation is considered important in the field of penology and mental hygiene, and is part of the program for improving the conditions in Federal prisons, and also an effort to promote uniformity in the medical work of the Federal Government.

It is obvious that important problems arise in connection with the detailed care of Federal prisoners and that the medical service of a modern prison involves certain routine procedure and also certain research activities, the latter relating directly to the solution of medical administrative problems and to increasing the sum of knowledge concerning technical medical questions. The routine requirements of a prison medical service involve the psychiatric examination and classification of prisoners and the treatment and supervision of all mentally diseased inmates. It also involves the conduct of physical examinations sufficient in scope to permit of the prompt recognition and correction of physical defects and diseases. All the necessary facilities for reasonably meeting these requirements are largely technical or administrative medical questions.

The psychiatric examination and classification of inmates is of very great value to those concerned with the application of disciplinary measures; with the protection of the mentally disordered inmate; with the protection of other inmates and employees; with the treatment of prisoners generally; with the transfer of mentally disordered persons to institutions most suited to give specialized care; and with the subject of parole and discharge of inmates. A more intimate knowledge of the mental characteristics of prisoners should contribute to a better understanding of several features involved in correctional systems

generally; to the necessity for specialized methods in care and procedure; and to the evolution of institutional facilities to meet requirements applicable to specific types of cases. Such a program will intimately dovetail with other activities of the prison, having for their object individual care, supervision, and disposition of inmates.

It is obvious that the inmates of prisons are subject to the same intercurrent physical and mental illnesses, diseases, or defects, as are seen among those that comprise the general population. A properly organized prison medical service, therefore, must be both general and special in character to meet these needs.

A well-organized medical service in a modern prison can contribute to the welfare of inmates and employees in ways other than those mentioned, by rendering advice and counsel respecting sanitation and personal hygiene; by helping to organize and guide recreational, educational, occupational, and vcoational activities with a view to promoting the health of both inmates and employees; and by giving assistance and advice for maintaining a wholesome and well-balanced dietary.

It is obvious that the chief medical officer of a large modern prison has an important and specialized duty to perform, and one requiring special training, administrative ability, tact, and judgment, and that adequate assistance is necessary for him to meet the demands of a well-balanced medical service.

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### Bromide Intoxication

Titus H. Harris and Abe Hauser, Galveston, Texas (J.A.M.A., July 12, 1930), report five cases and conclude that bromide intoxication is a frequent condition and must be considered in the diagnosis of any case showing an acute organic type of reaction. The diagnosis is simple with the Wuth comparator, which is accurate enough for clinical purposes and does not require technical skill. The symptoms, while essentially those of an acute organic reaction, will vary with the personality make-up and other toxic factors. After the clinical opinion has been confirmed the treatment is relatively simple, consisting of forcing fluids and administering large amounts of sodium chloride. If the patient is unable to take fluid by mouth, physiologic solution of sodium chloride may be given by rectal drip and hypodermoclysis. Usually after twenty-four hours of this medication the patient will be aroused enough to take liquids by mouth and physiologic solution of sodium chloride may be given in amounts of 8 ounces (235 cc.) every two hours. With this program he will get from 200 to 250 grains (13 to 16.5 Gm.) of salt in twenty-four hours. The patient may then become restless and more difficult to control, and he frequently expresses ideas of persecution and has hallucinations freely. These symptoms gradually subside as the bromide is eliminated and recovery occurs in from ten days to three weeks, depending on the severity of the bromide retention.

℞

### Mechanism of Spinal Block In Epidemic Meningitis

Paul F. Stookey, B. Landis Elliott and Frank R. Teachenor, Kansas City, Mo. (J.A.M.A., July 12, 1930), present extracts from a case history with its associated necropsy report to illustrate a typical spinal block with marked swelling of the spinal cord. In their experience, the most frequent cause of spinal block as a complication of epidemic menigitis is swelling of the spinal cord. When spinal block is established as a complication of epidemic meningitis, treatment should be instituted by drainage and instillation of Flexner's serum by way of the cisterna magna, associated with the intravenous administration of 50 per cent dextrose in an attempt to reduce edema in the spinal cord.

℞

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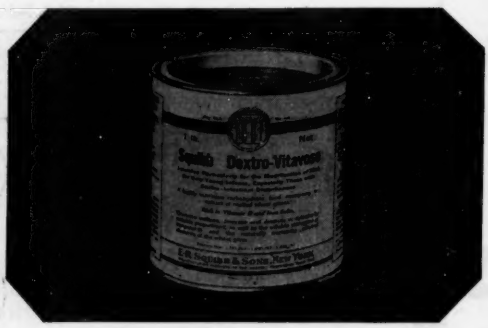


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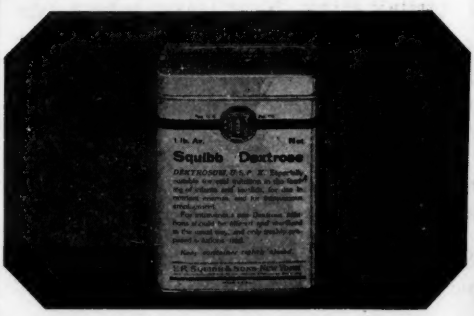


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Members of the Component County Societies are members of the Kansas Medical Society. Physicians residing in counties where no County Society exists may join the society of an adjoining county. Physicians residing where no County Society exists, who are members of a district or other independent society approved by the Council, may be admitted to membership.

**ANNUAL DUES due on or before February 1st of each year.**

Dues should be paid to the Secretary of the Component County Society, or, if not a member of a County Society, to the Secretary of the Kansas Medical Society.

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For example, our attention has just been called to a case for which a physician prescribed "gelatine" in the diet of a diabetic. When indications of acid developed it was learned that the patient had unwittingly been using a ready-flavored jelly powder containing about 85% sugar, 2% acid-flavoring, 12% gelatine and coloring matter.

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We have a recipe book for diabetic diet, prepared by a widely known dietetic authority, which is entirely suitable and most helpful for distribution among diabetic patients. We will be glad to send any physician as many as he may need.

*Here is an ideal recipe for the Diabetic Diet.*

**FRUIT JELLY**
(Six Servings)

| | Grams | Prot. | Fat | Carb. | Cal. |
|---|---|---|---|---|---|
| 1 tablespoon Knox Sparkling Gelatine | 7 | 6 | .... | .... | .... |
| ¼ cup cold water | .... | .... | .... | .... | .... |
| 1½ cups boiling water | .... | .... | .... | .... | .... |
| ¼ cup lemon juice or 1½ teaspoons citric acid | 40 | .... | .... | 4 | .... |
| Grated rind of one lemon | .... | .... | .... | .... | .... |
| 1½ grains saccharin | .... | .... | .... | .... | .... |
| 6 sections orange | 75 | 1 | .... | 9 | .... |
| 6 sections grapefruit | 90 | .5 | .... | 9 | .... |
| Total | | 7.5 | .... | 22 | 118 |
| One serving | | 1 | .... | 4 | 20 |

Soak gelatine in cold water five minutes. Boil water and rind for two minutes. Add to gelatine and stir until dissolved. Add lemon flavoring and saccharin, strain and chill. Cut each section of fruit into three pieces. When jelly is nearly set, stir in cut fruit, mold, chill until firm and serve plain, with thin cream or whipped cream.

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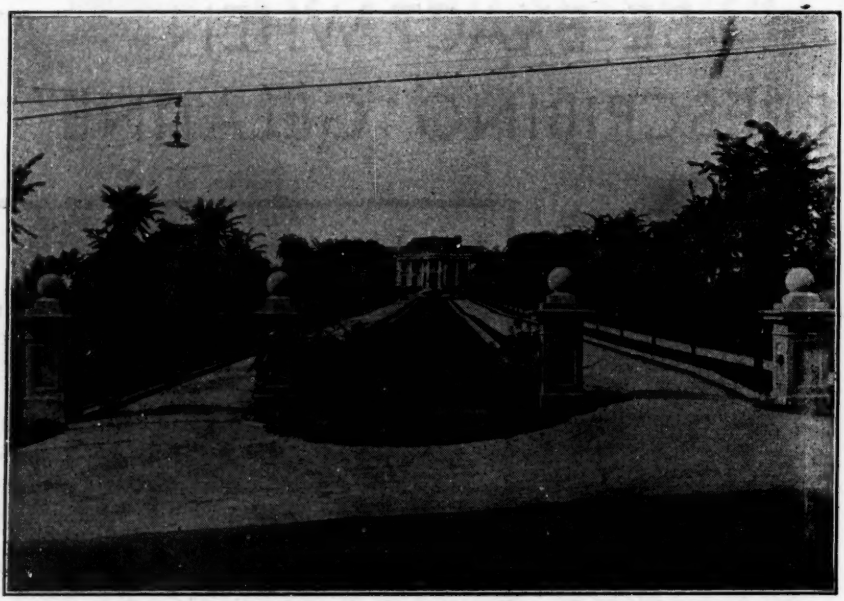

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in

## Difficult Feeding Cases

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In difficult feeding cases commonly known as Marasmus or Malnutrition, the first thought of the attending physician is an immediate gain in weight, and then to so arrange the diet that this initial gain will be sustained and progressive gain be established.

Every few ounces gained means progress not only in the upward swing of the weight curve, but in digestive capacity in thus clearing the way for an increasing intake of food material.

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| | |
|---|---|
| **Mellin's Food . . . .** | **8 level tablespoonfuls** |
| **Skimmed Milk . . . .** | **9 fluidounces** |
| **Water . . . . . .** | **15 fluidounces** |

This mixture furnishes 56.6 grams of carbohydrates in a form readily assimilated and thus quickly available for creating and sustaining heat and energy. The mixture supplies 15.5 grams of proteins for depleted tissues and new growth, together with 4.3 grams of mineral salts which are necessary in all metabolic processes. These food elements are to be increased in quantity and in amount of intake as rapidly as continued improvement is shown and ability to take additional nourishment is indicated.

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